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DETROIT

Automotive Daily News

★CARS★ SHOP EQUIPMENT TRUCKS ★★AVIATION★★ PARTS ACCESSORIES ★TIRES★

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REEVES FINDS OUTPUT GAINS IN ALL PLANTS

Expects Upturn to Continue Well Into the Summer

DETROIT, Mich., April 16.—Continued progress in production and sales as a result of good weather and the spring selling season was evidenced in all of the factories visited by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, during his sojourn among the Michigan plants in the past ten days.

Mr. Reeves came here today to call on the Detroit plants prior to his departure to New York tomorrow night.

"While every company is not sharing equally in the improvement," stated Mr. Reeves, "all plants have had an upturn during the past few weeks that is expected to continue well into the summer. Manufacturers are watching dealers' stocks carefully and in fact, the largest part of the work of manufacturers now seems to be in the direction of improving the position of those who market the product to the final consumer.

"The industry has solved many of its problems, notably the one with respect to the dates for announcing annual models. However, there are

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SALES OF CHEVROLET IN U. S. FOR MARCH 48% OVER FEBRUARY

Detroit, April 16.—Domestic sales of new Chevrolet passenger cars and trucks in March totaled 73,628 units, a gain of 48 per cent. over February, H. J. Klingler, vice-president and general sales manager, announced today.

Dealer stocks of new cars were reduced by 6,500 units as a result of the satisfactory showing, and dealer used car stocks also dropped more than 5,000 units during the month, according to Mr. Klingler. World production for March, as previously announced, was 79,603 cars and trucks. Each ten-day period during the month showed extensive gains over the previous period.

For the first days of March sales totaled 17,224 units; for the second like period 24,910 cars and trucks, and for the last ten days, 31,494 units, Mr. Klingler said. While final figures for the first ten days of the current month have not yet been received, dealers' reports already received indicate that the progressive gains made in March are being continued into April, according to the Chevrolet executive; that the final domestic sales in February were 49,690 units; in January, 46,014, and

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BLEES REPORTS BUSINESS TREND DEFINITELY UP

Predicts Slow but Steady Return to Normal Activity

PONTIAC, Mich., April 16.—W. A. Blees, vice-president in charge of sales of Oakland-Pontiac, who recently returned to his desk following the completion of three months' tour of the country, putting on a series of dealer meetings, expressed the opinion this morning, based on his observations on the long trek, that the machinery of American business is gradually picking up momentum on a slow but sure climb backward toward normal that should continue through this year and next.

"Doubtless the progress of busi-

(Continued on Page 2)

LIBBEY-OWENS-FORD IN TRIPLEX DEAL, SAYS N. Y. REPORT

New York, April 16.—A working agreement is being arranged between the Libbey-Owens-Ford Plate Glass Company and the Triplex Safety Glass Company of North America, Inc., according to reports announced in Wall Street today.

The principal effect of the arrangement, it is pointed out, will be the furnishing by Libbey-Owens-Ford of a large share of the glass used by the Ford Motor Company.

Triplex has a contract with Ford

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Early Returns Reveal 22% Gain in March Truck Registrations

Registration Totals From Nineteen States and District Of Columbia Show Favorable Seasonal Upturn

NEW YORK, April 16.—Registrations of new commercial cars in nineteen states and the District of Columbia, the first to report for March, amounted to 10,799, as compared with 8,820 in the same states in the preceding month, a seasonal upturn of 22 per cent.

The registration statistics show that this March total compared with 15,624 for the same states in the corresponding month of last year, a falling off of 30 per cent. Sales of trucks in the same states declined 24 per cent. in February from the corresponding period of 1930.

In two states and the District of Columbia, new truck registrations in March exceeded those of the corresponding month of last year. These states were Minnesota, with 1,230, as compared with 889; Utah, with 245 against 234, and District of Columbia, 157 against 131.

In fourteen states and the District of Columbia, sales in March were greater than in the preceding month. The states were Connecticut, Delaware, Idaho, Illinois, Maryland, Minnesota, Montana, North Carolina, North Dakota, Ohio, South Carolina, Utah, West Virginia and Wisconsin.

Following are the registrations of new commercial cars in the reporting states for March, as compared

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CONTINENTAL BUILDS NEW SIX-CYLINDER AUTOMOBILE ENGINE

Detroit, April 16.—Deliveries are shortly to be made of another new series, in four sizes, of Continental six-cylinder, L-head engines, to be known as the E-600, L. J. Kanitz, general sales manager of Continental Motors Corporation, announces.

"This group, designed for high speed and performance, yet of comparatively low weight, in nowise supplants any of our present models, but on the other hand it provides an even more closely graduated series between the well known model 16-C and our heavier R series of overhead valve type.

"All of these E-600 are of 4½-inch stroke, but the bores are 3¼, 3⅞, 4⅛ and 4¼ inches, with displace-

(Continued on Page 2)

Late News Flashes

Basle, Switzerland, April 16.—The fifteenth annual Swiss Industries opened here this week with a registration exceeding the most optimistic expectations. High Swiss authorities and business men from all over the world are attending the fair. This exhibition is more complete and attractive than ever before and the outlook for good business is promising.

* * *

Montreal, Quebec, April 16.—The tanker Acardo today opened ocean navigation at the port of Montreal. The vessel was from Curacoa with a cargo of 8,000 tons of gasoline, consigned to the Shell Company of Canada.

* * *

Detroit, April 16.—The Guiberson Diesel-motored Waco plane will be demonstrated at the national aircraft show. Art Goebel, noted flyer, flew the new Diesel-engined plane here from Texas, covering 1,150 miles in 11 hours and 20 minutes. Fuel consumption amounted to 89 gallons of oil and 14 pints of lubricating oil. Cost of the fuel was $8.90 and the lubricating oil $2.40. The engine has only 1,500 parts, as compared with from 5,000 to 6,000 parts in a gasoline engine. The engine was designed by the Guiberson Corporation of Dallas.

* * *

Washington, April 16.—Based on reports from 13,000 establishments, 152,000 more persons were employed in March than in January this year, according to Secretary of Labor Doak. Pay rolls in March exceeded those of January by $13,500,000.

General Motors Exports Continue to Exceed 1930

NEW YORK, April 16.—Shipments of cars and trucks by General Motors manufacturing divisions to their dealers in Canada and other foreign markets in March continued to run ahead of a year ago. This was the fourth consecutive month in which export sales by the corporation exceeded the corresponding period of the preceding year.

Increases over a year ago were established in December, 1930, and in January, February and March of this year.

According to the corporation's export figures for March, now available for the first time, shipments to Canadian and overseas dealers amounted to 20,252 in that month, as against 15,630 in February, a gain of 29.6 per cent., and comparing with 17,849 in March of last year, an increase of 13.5 per cent.

This was the largest margin of increase made in any month this year. January exports were up 5 per cent. over the corresponding month of 1930, while the Febuary gain was 3.4 per cent. The December, 1930, increase, however, was the largest of any of the four months, amounting to 214 per cent. It was in that month that the export tide turned for the better after having been on the downgrade for more than a year.

For the first three months of this year, General Motors shipments to its foreign dealers amounted to 48,550, as compared with 45,192 in the corresponding period of last year, an increase of 7.4 per cent. This compared with a gain of 2.2 per cent. in the first two months of the year.

The above figures include unit sales of Chevrolet, Pontiac, Oldsmobile, Marquette, Oakland, Viking, Buick, La Salle and Cadillac passenger and commercial cars, but do not include shipments of foreign manufacturers controlled by General Motors, such as Opel Motor Works in Germany and Vauxhall Motors in England.

Although exports of General Motors in the final quarter of last year showed a real improvement over the preceding periods of that year, the improvement has been even more pronounced in the first three months of 1931. The total of 48,550 for the first quarter of this year

(Continued on Page 2)

The Three Requisites for Dealer Success in 1931

—See Page 4

SPECIAL SPRING CAR DISPLAYS IN LINCOLN DRAW LARGE CROWDS

Lincoln, Neb., April 16.—Spring displays staged by a number of Lincoln dealers have been held during the past week or will be held during the coming week, and those dealers who have already had exhibits report that new car sales prospects are much more encouraging this spring than a year ago. About 2,000 persons attended the opening display of the J. H. Hansen Motor Company. This firm is state distributor for Auburn and Cord, having display rooms in both Omaha and Lincoln. H. W. Coffey has been engaged as sales manager and Paul F. McGerr as service manager of the Lincoln establishment.

E. D. King, president of King Motors, Inc., South Platte territory distributors of Willys-Knight and Willys cars, reports a decided increase in sales as the result of a display held last week in connection with the removal of the company's headquarters to larger quarters.

Rogers Motor Company, Ford dealer, and the Du Teau Chevrolet Company are staging special spring displays this week. Included in the Ford display are all sport model jobs produced by the Ford Motor Company. These are shown in a wide variety of colors, including some special paint jobs produced in the Rogers Company paint shops. In connection with the display is a cut-away chassis of the Model A.

CHEVROLET SALES SHOW SHARP GAINS

(Continued from Page 1)

in December, the first full month when the 1931 cars were in dealers' hands, were 46,605. In these months Chevrolet domestic passenger car registrations led all other makes, while the returns from twenty-one states for March also show this six-cylinder General Motors car leading the passenger car field.

TRIPLEX EXECUTIVE SEES UPTURN IN RETAIL TRADE ON TOUR OF THE COUNTRY

New York, April 16.—That the retail automobile and accessory industry throughout the United States is generally in very good shape and is beginning to feel an upswing is the observation of C. F. Leland, sales manager of the Triplex Safety Glass Company of North America, who has just completed a tour covering nearly every section of the country.

"A reliably sound trend upward has begun along the Pacific Coast and is noticeable in some isolated localities," Mr. Leland finds. "It may be expected to be marked in the Middle West and East by summer.

"Taken as a whole, the automotive retail trade has come through the winter in better shape than it had perhaps expected to.

"Co-operative effort by industries has been marked in the past months. In some parts of the country, as on the Pacific Coast, groups of industries have combined in a movement of mutual action to stimulate business. In so marked a form, this is a new development.

ALLIS-CHALMERS TAKING OVER ADVANCE-RUMELY; TO OPERATE AS UNIT

Chicago, April 16.—Acquisition by Allis-Chalmers Manufacturing Company of the plant and branches of the Advance-Rumely Corporation is likely to be completed by May 1, when the former company will take over Advance-Rumely for the purpose of supplementing its farm equipment lines. The merged companies will operate as one unit, but the terms for the exchange of securities have not yet been decided upon. Negotiations are now under way to work out the legal aspects of the merger with the Federal Trade Commission.

Max W. Babb, vice-president of Allis-Chalmers, stated: "The lines controlled by Allis-Chalmers Manufacturing Company and Advance-Rumely Corporation do not overlap but supplement each other. The acquisition of the assets of Advance-Rumely Corporation under consideration will largely augment the business of Allis-Chalmers in the agricultural machinery field."

REEVES FINDS GAINS THROUGHOUT INDUSTRY

(Continued from Page 1)

still a number of important conditions to which attention is being given by the leaders of the national automobile Chamber of Commerce headed by President Macauley.

"First, and most important, comes the necessity for developing a respect, once again, for the list price of the motor car. The building up of the industry was based on the list price, but there has been little respect for it in the past couple of years and of late, it has been simply the starting point for trading by the buyer.

"Continued educational work is being done among the bankers so that they might better understand when dealers are entitled to credit, based not alone on this financial statement, but also on the prospects for the car he is handling and the reputation of its manufacturer.

"The other very important point relates to world trade because our export business in 1929 required two months' production of all the plants in this country.

"Tariff is a controversial subject on which there are many views. It is a fact, however, that many countries of the world are directly discriminating against American motor cars. We can object little to proper tariffs for either revenue or the protection of an industry because we live in a tariff protecting country. However, we are opposed to these indirect discriminations that have been practiced in half a dozen countries, with threatened increases among others, and presentations are being made by our representatives on behalf of dealers handling American products.

"The manufacturers are keeping their poise, with no inclination to use hypodermics that only bring bad after effects."

GENERAL MOTORS EXPORTS TOP 1930

(Continued from Page 1)

compares with a total of 26,097 for the final quarter of last year, a gain of 85 per cent.

For the full year 1930 General Motors export shipments amounted to 138,365, as against 363,415 in the preceding year, a decline of 62 per cent.

With exports by General Motors away to a flying start in the first quarter and improvement anticipated during the coming months, there is every indication that the foreign business of the corporation this year will compare very favorably with that of last year, if it doesn't actually exceed the 1930 total by a good margin.

Following are the figures for the last fifteen months, as compared with the corresponding periods of the preceding year. These figures were obtained by subtracting the General motors shipments to dealers in the United States from total shipments to dealers, including Canadian and overseas shipments, as provided by the corporation in its monthly reports in the course of the year:—

	1930	1929
January	12,051	32,139
February	15,292	33,926
March	17,849	43,881
April	18,296	51,084
May	11,314	44,404
June	9,845	37,050
July	9,260	32,317
August	9,470	20,834
September	8,891	19,263
October	5,239	23,545
November	9,102	21,232
December	11,756	3,740
Year	138,365	363,415

	1931	1930
January	12,668	12,051
February	15,630	15,292
March	20,252	17,849
	48,556	45,192

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BLEES PREDICTS STEADY INCREASE IN NATION'S TRADE

(Continued from Page 1)

ness will be slow, and it will be accompanied by normal seasonal variations," he said, "but the fact remains that all major factors point definitely upward.

"Among these factors is the vital one of employment. More and more workers are being recalled to their former jobs or to other jobs created by the building activities, the construction projects and the railroad improvements which have been inspired by low but already firming costs of materials and commodities.

"Another factor is that of inventories, which during the eighteen months of the depression have slipped down to rock bottom. By inventories I mean not only the stocks of raw and manufactured goods in the hands of suppliers, manufacturers and merchants, but also consumer inventories—those articles of clothing, furniture and equipment which the public has been using and wearing out during the period of the depression."

MARCH TRUCK SALES 22% OVER FEBRUARY

(Continued from Page 1)

with the corresponding month of last year, and with February of this year:

	Mar., 1931	Mar., 1930	Feb., 1931
Arkansas	236	324	267
Connecticut	469	567	286
Delaware	108	142	59
Florida	381	444	389
Idaho	139	171	99
Illinois	1,502	2,386	1,439
Maryland	450	809	298
Minnesota	1,230	889	296
Missouri	1,595	3,011	1,795
Montana	209	309	151
North Carolina	533	589	370
North Dakota	138	206	89
Ohio	1,194	1,813	1,021
South Carolina	243	273	237
South Dakota	177	370	225
Utah	245	234	156
Virginia	572	1,234	863
West Virginia	248	424	216
Wisconsin	973	1,298	452
Dist. of Columbia	157	131	112
Totals	10,799	15,624	8,820

CONTINENTAL MOTORS OFFERS NEW ENGINE

(Continued from Page 1)

ments of 388.3, 318.0, 360.7 and 382.9 cubic inches, respectively.

"Several striking features of design in manifold, cam shaft and combustion chamber have resulted in a happy combination of unusually high torque characteristics over a wide speed range. At the same time the typical Continental strength and sturdiness have been coupled with low weight. Full provision has been made in basic design for all the current accessories, such as oil filter, air cleaner, air compressor, etc., and for dual ignition. Interest in this new series as evidenced by our customers is distinctly gratifying."

MOTOR PRODUCTS CORP. REPORTS $92,687 NET

Detroit, April 16.—Motor Products Corporation reports for the quarter ended March 31, 1931, a net profit of $92,687 after depreciation and Federal taxes, equivalent to 47 cents a share on 195,699 no-par shares of common stock. This compares with $232,019 or $1.17 a share on 197,366 shares in first quarter of 1930.

SPARKS *from* DETROIT

Down the Line With Ford

* * *

De Vaux Steps Up

* * *

"The Bunghole"

* * *

Chris Sinsabaugh—Detroit Editor

HOW Andy Brown, the statistically inclined member of the well-known firm of Amos 'n' Andy, Incorpulated, would delight in "figgerin' " on Ford's twenty-eight years' production! Seven million, eight million, nine million—and he wouldn't have reached even the half-way mark.

Twenty million cars, all of one make—that's surely a peak, a mountain peak, in the automobile industry. Reaching that total last Tuesday morning, Henry and Edsel must be wearing the smug and satisfied look of the cat that ate the canary.

It took a lot of digging through the archives out at River Rouge to unearth for this column a breakdown on this 20,000,000 production, but the results seem well worth recording right her on this bulletin board of the automobile industry. So here goes.

* * *

THERE have been only ten different Ford models in these twenty-eight years. Model A came out in 1903 and ran through 1904. It was a two-cylinder vehicle and the output total 1,780. In 1904 the company got ambitious and brought out a four-cylinder, known as B, and also a two-cylinder, C, and the combined count was 1,695. B was on the market three years and C two. Another two-cylinder, Model F, ran through 1904 and 1905 and 1,599 were manufactured.

Then came the sensation of those early days, the Model N, the four-cylinder job carrying a $500 tag, a price that made us goggle-eyed, and we wondered how it could be done. That really was the start of Mr. Ford's mass production idea, the turn in the road that made him what he is today. The introductory price was boosted a bit later, but in my opinion Model N was the cornerstone of the House of Ford. That came out in 1906, along with K, R and S. K was a six-cylinder, high-priced model, with planetary gear and also a sensation in those days. These models ran through '06, '07 and '08 and the combined production was 23,616.

Famous Model T followed and was the sole breadwinner from 1908 to 1927, in which stretch some 15,000,000 were made. No use telling you about Model A of today—it looks as if that chapter of Ford history is by no means completed.

* * *

THE telephone just buzzed. Grand Rapids calling. It must be Jim Houlihan. And Jim Houlihan it was, bubbling over with news about De Vaux production and the like.

"The Oakland plant went into production Wednesday and Gov. Rolph of California was there to see the first car come off the line," chirped De Vaux's advertising counsel. "In about ten days governors of the Western states will attend a De Vaux reception at Oakland. Here in Grand Rapids, we are up to fifty cars a day.

"George Browne, our Wisconsin distributor, had his big party last Sunday and now all Wisconsin has met the De Vaux. George has seven dealers in Milwaukee alone. By the way, he did fairly well at the automobile show he held on the Grand Haven-Milwaukee steamer, which was so graphically described in your column. He promised to sell ten cars at retail before he landed. He sold seven.

"We have cut into Detroit and the Detroit-De Vaux Company, at the head of which is Dr. S. J. Rund, will open up on Woodward Avenue.

"The telephone charges are on me." And the meeting adjourned sine die.

* * *

AH, HA, one of my public at least read the merry quip about calling the Detroit-Windsor vehicular tunnel the Heart-to-Heart Highway because the company advertises "From the heart of Detroit to the heart of Windsor." A coincident, this reader writes from Rye, N. Y., (get that?) and he says:

"Heart-to-Heart Highway deserves the red ribbon, but so long as this tube runs from Canada to the United States, why not call it the 'Bunghole' and let it go at that? Of course, if it ran from the United States to Canada—well, that would be different."

You guessed it—Gregory Flynn wrote the letter and he really lives in Rye.

Ford Car March Sales Exceed February by 65%

19 OF 20 STATES SHOW GAINS OVER PRECEDING MONTH

NEW YORK, April 16.—Although still running substantially lower than a year ago, retail sales of new Ford passenger cars are registering sharp upturns in each successive month. According to registration returns received from twenty states and the District of Columbia, Ford sales in March showed a gain of 65 per cent. over those of the preceding month in the same states.

Ford registrations in these states, which are listed below, amounted to 18,964, as compared with 11,401 in February, a seasonal upturn of 65 per cent., and comparing with 38,640 in the same states in March of last year, a falling off of 50 per cent.

Registrations of new Fords in the first three months of this year amounted to 43,101, as compared with 91,974 in the first quarter of last year, a decline of 53 per cent. It is thus seen from the March figures that the rate of decline from last year is being reduced as the year progresses.

Sales of the Ford in nineteen of the twenty states in March were higher than in the preceding month. The state in which a decline occurred was South Dakota.

Field reports from all parts of the country indicate that the upturn in Ford sales has continued through the first half of this month and that a much better showing in relation to last year is being made than in the earlier months of the year. Indications are from current reports that Ford sales have increased sufficiently to reduce the rate of falling off from 1930 to not greater than 40 per cent., and an even better showing is possible.

In considering Ford registration figures, it should be borne in mind that the first quarter and the first half of 1930 were the peak periods for the Ford Motor Company for recent years. Sales of Ford cars in the first half of 1930 exceeded those of the corresponding period of the boom year, 1929. It is only natural, therefore, that there should be a considerable difference between sales in the early months of this year and those of 1930.

Following are the registrations of new Ford cars in the reporting states for March, as against the corresponding month of last year, and February of this year:

	Mar., 1931	Mar., 1930	Feb., 1931
Alabama	664	1,327	323
Arkansas	302	1,036	274
Connecticut	791	1,367	389
Delaware	179	337	105
Florida	833	1,423	682
Idaho	192	518	115
Illinois	3,153	8,112	2,598
Maryland	890	1,713	634
Minnesota	2,046	3,360	491
Montana	326	593	195
New Hampshire	338	341	146
North Carolina	962	1,583	644
North Dakota	254	458	167
Ohio	3,250	7,059	2,298
South Carolina	548	699	319
South Dakota	245	771	302
Utah	273	536	132
Virginia	1,044	2,082	51
West Virginia	445	1,053	295
Wisconsin	1,320	3,349	804
Dist. of Columbia	909	873	437
Totals	18,964	38,640	11,401

Following are the registrations of new Ford cars in the reporting states for the first quarter of 1931, as against the corresponding period of last year:

	1931	1930
Alabama	1,284	3,912
Arkansas	1,059	2,978
Connecticut	1,510	3,767
Delaware	331	819
Florida	2,636	5,380
Idaho	496	1,112
Illinois	7,874	17,625
Maryland	1,985	3,718
Minnesota	3,182	6,122
Montana	763	1,321
New Hampshire	518	527
North Carolina	2,207	4,253
North Dakota	542	1,110
Ohio	7,541	16,900
South Carolina	1,228	2,845
South Dakota	863	2,424
Utah	495	1,107
Virginia	2,897	5,444
West Virginia	1,008	2,236
Wisconsin	2,833	6,601
Dist. of Columbia	1,799	1,773
Totals	43,101	91,974

Dealer Finds Direct-by-Mail Advertising Carries Appeal

Have the
33
VITAL POINTS
of your car
LUBRICATED
for only $1.00
CENTRE MOTOR SALES
GET READY
for Spring Driving
for only $4.90
CENTRE MOTOR SALES
ANNOUNCEMENT!
It gives us pleasure to be able to inform car owners that we have enhanced our Bergenfield Repair Shop Service by the installation of a Hydraulic Lift, which facility will insure speed, accuracy, and thoroughness in aligning or tightening your car.
Our charges for this work are:
Aligning $1.00
Tightening $2.00
CENTRE MOTOR SALES CORP.
215 S. Washington Ave. Bergenfield, N. J.

The Center Motor Sales, Chevrolet dealer in Bergenfield, N. J., while a consistent newspaper advertiser, is a firm believer in the person direct-by-mail appeal.

In most cases this concern uses government post cards, and has found the response to this form of advertising gratifying.

Above are reproduced three mailings in the first quarter, each about a month apart. The $1 lubricating mailing can be used every quarter, if not more often, while the $4.90 job is strictly a one-time mailing for the early spring driveing season.

The third card, announcing the installation of a hydraulic lift for lubricating and tightening, resulted in a large response, some out of curiosity, but all taking the $1 lubrication, and many including the tightening job as well.

This method of advertising is inexpensive, and while it might be tossed away almost immediately, it probably will register in the car owner's mind before it reaches the waste paper basket.

NEW ORLEANS FORD PLANT PROMOTION

New Orleans, La., April 16.—Announcement of two promotions at the local branch of the Ford Motor Company was made by E. H. Stolz, branch manager. These were elevations of W. K. Hanson, formerly Lincoln division manager, to wholesale manager of the branch, and of George P. Montagnet from assistant wholesale manager to Lincoln division manager.

In his new position Mr. Hanson will have charge of the distribution of Ford products for the New Orleans territory, and already is said to have pepped up dealers of this area.

SHEETS HEADS HIS OWN CHEVROLET DEALERSHIP

Chicago, April 16.—Through acquisition of the interests of John H. Orme by Samuel Sheets, the Orme & Sheets Motor Sales Company has been succeeded by the Sheets Chevrolet Sales Company. Headquarters are at the same location as heretofore, 6522 Cottage Grove Ave., with a super-service station at 632 East 71st St. Sheets was associated with Orme as a South Side Chevrolet dealer for the past eight years, previous to which he was with the Studebaker Sales Company of Chicago.

NEW $80,000 PLANT FOR FORD DEALER

Charlotte, N. C., April 16.—Pettit Motor Company will construct a modern and complete service and sales plant for Ford cars on the East 4th Street site now occupied by the City-County Market, it was announced by J. B. Pettit, owner of the company. The building will cost approximately $80,000.

The concern has arranged a long lease on the property and work has already started tearing down a part of the present structure. However, the market will continue to be operated at this location until May 1, when it will be moved to East Morehead Street.

Mr. Pettit said that the new building will be completed by July 1. It will have 30,000 square feet of floor space and will give the company about three times the space it has in the West 5th Street building which it now occupies.

L. C. WHITNEY CLAIMS ST. PAUL DEANSHIP

St. Paul, Minn., April 16.—A survey of St. Paul reveals that L. C. Whitney, owner of the East Side Motor Sales, Ford dealership, at East 7th Street and Maria Avenue, claims the honor of being the oldest operating Ford dealer in St. Paul.

Mr. Whitney has operated his business in the same location since 1921. For a year previous to that time he operated at 651 East 7th St. His present garage and showrooms were erected in 1921. It is a one-story brick structure and a used car lot is operated adjacent to the building.

The company has shown a large increase in business during the past few years. In 1930 total volume of business reached $325,000, Mr. Whitney said.

Retail Car Sales in East Turn Up Sharply in March

NEW YORK, April 16.—Retail sales of new passenger cars in the three Eastern states of Delaware, Maryland and West Virginia in March showed a more than normal seasonal upturn over the preceding month, according to registration returns now available. The rate of decline from last year was the same as in the earlier months of the year.

Aggregate registrations in March in the three states were 5,287, as against 7,848 in the corresponding month of last year, a decline of 32 per cent., and comparing with 3,435 in February, a seasonal upturn of 54 per cent.

For the first three months of the year aggregate registrations in the three states were 11,546, as against 17,158 in the first quarter of 1930, a decline of 32 per cent.

Retail sales of new cars in Delaware last month totaled 564, as against 340 in the preceding month, a gain of 66 per cent., and comparing with 869 in March of last year, a falling off of 35 per cent. For the first three months sales in this state were 1,195, as compared with 1,843 a year ago, off 35 per cent.

Registrations of new cars in Maryland in March were 3,259, as against 2,074 in February, a gain of 57 per cent., and comparing with 4,377 a year ago, off 25 per cent. For the first quarter, Maryland registrations were 6,942, as compared with 9,567 a year ago, off 27 per cent.

In West Virginia in March, registrations amounted to 1,464, as against 1,021 in the preceding month, a gain of 43 per cent., and comparing with 2,602 in March of last year, a decline of 43 per cent. For the first three months of the year, West Virginia registrations were 3,409, as against 5,748 in the similar 1930 period, a falling off of 68 per cent.

Following are the new car registrations in the three states for March, as against March, 1930, and February, 1931:

	Mar., 1931	Mar., 1930	Feb., 1931
Delaware	564	869	340
Maryland	3,259	4,377	2,074
West Virginia	1,464	2,602	1,021
Totals	5,287	7,848	3,435

Following are the registration figures for these states for the first three months of this year, as compared with the corresponding period of 1930:

	1931	1930
Delaware	1,195	1,843
Maryland	6,942	9,567
West Virginia	3,409	5,748
Totals	11,546	17,158

Following are the registrations of some of the leading selling cars in each of the three states for March, 1931, as against the corresponding month of last year, and comparing with February, 1931:

DELAWARE

	Mar., 1931	Mar., 1930	Feb., 1931
Ford	179	387	105
Chevrolet	163	203	103
Buick	44	44	27
Oldsmobile	18	18	15
Pontiac	29	27	15
Packard	7	20	7
Essex	7	21	7
Hudson	11	10	6
Dodge	1	7	5
Studebaker	7	10	5
Willys	11	9	5

MARYLAND

Chevrolet	1,247	1,353	722
Ford	890	1,713	634
Buick	136	154	85
Pontiac	134	149	78
Studebaker	76	87	55
Dodge	53	85	53
Nash	50	55	43
Oldsmobile	59	65	38
Essex	76	143	37
Plymouth	44	30	37

WEST VIRGINIA

Chevrolet	472	735	338
Ford	445	1,053	295
Pontiac	72	69	49
Dodge	53	88	43
Oldsmobile	31	56	35
Willys	52	42	34
Buick	33	44	30
Essex	51	83	24
Plymouth	27	41	23
Chrysler	43	44	18

Following are the registration figures for the same cars for the first three months of the year, as compared with the corresponding period of 1930:

DELAWARE

	1931	1930
Ford	381	819
Chevrolet	363	418
Buick	83	102
Oldsmobile	36	30
Pontiac	62	68
Packard	23	35
Essex	27	55
Hudson	17	25
Dodge	8	10
Studebaker	12	14
Willys	17	22

MARYLAND

Chevrolet	2,623	2,861
Ford	1,995	3,718
Buick	312	466
Pontiac	321	470
Studebaker	132	188
Dodge	146	163
Nash	120	137
Oldsmobile	115	157
Essex	169	325
Plymouth	106	82

WEST VIRGINIA

Chevrolet	1,143	1,584
Ford	1,003	2,236
Pontiac	154	158
Dodge	131	213
Oldsmobile	81	113
Willys	112	101
Buick	94	100
Essex	104	236
Plymouth	74	96
Chrysler	80	101

FORD'S NEW PRESSED STEEL PLANT ON COAST STARTS MAKING FENDERS

Long Beach, Cal., April 16.—Automobile fenders are now being turned out daily at the new pressed steel unit of the Ford company. The steamer Nelson Traveler is due with pressed steel for the plant, and until then operations in the new unit will not be extensive.

The new pressed steel unit will employ about 250 men at the outset, and will increase production as fast as men can be trained to the work. Later, it is expected to run three shifts, totaling about 640 men.

The assembly plant is now employing 1,900 men and turning out 234 cars and trucks daily. The company expects to turn out about 4,500 cars during April.

The Ford steamer, Onondaga, docked at the plant a few days ago from Chester, Pa., with a cargo of 2,000 tons of parts for the assembly plant.

FOLEY CHEVROLET BREAKS ALL MARCH SALES RECORDS

Newark, N. J., April 16—All sales records for the month of March were broken by the Foley Chevrolet Sales Company last month, E. J. Foley, president, has announced. Mr. Foley said that the record established by his firm is reflected in increased business by Chevrolet agents throughout the United States. While all have not made new sales records, every one has shown a healthy increase in business, he said.

DON HARRIS RECOVERING

Spartanburg, N. C., April 16.—Don R. Harris, head of the Harris Motor Company, Inc., local Ford dealership, who recently underwent an operation for appendicitis, is said to be improving rapidly at his home, 383 Pine St.

UNDERWOOD PROMOTED

Indianapolis, Ind., April 16.—Charles E. Underwood, a Ford salesman here for the last eight years, has been appointed sales manager of the Wangelin-Sharp Company, Ford dealers here.

Automotive Daily News

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A Significant Activity

WE found considerable significance in a recent announcement from the Department of Labor to the effect that during 1930 erection of private garages led all other types of building in this country. The statistics quoted covered building permits granted in 311 of the 319 cities in the United States with populations of 25,000 or more. Permits for private garage building numbered 97,458, which was 46.4 per cent. of the total number of building permits issued in those cities. Statisticians tell us that returns from such a large segment of our national population are perfectly reliable as showing conditions for the country as a whole.

As we read the figures they prove that Americans generally, in spite of a depression that largely decreased many incomes, have no intention of altering their use of motor transportation. They have postponed making many purchases that they would ordinarily have done, but they have managed to provide proper housing for their cars. Obviously this suggests that when the trade winds once again blow from the propitious quarter Americans will again resume purchases of motor transportation on their traditional basis.

Col. Ayers' Statement

IN his mid-month statement Col. Leonard Ayres of Cleveland tells us that during the first quarter of 1931 there has been a definite improvement, even after making due allowance for seasonal factors, which are usually favorable at this time of year. Col. Ayres believes that all evidence points to the fact that the bottom of the depression has been reached, but he adds: "As yet there are no trustworthy signs to show how far ahead that bottom is likely to extend."

Whether it is that we have accustomed ourselves to the new conditions, or that conditions actually have improved, we cannot say, but certainly there is a very much better feeling throughout the business world. Our own industry had about as severe a blow as any, when the depression first started, but our dealers who have weathered the storm are plugging along and most of them are making more money than they did last year, when we had our synthetic boom. The feeling among automobile dealers is decidedly more optimistic than sales volume justifies. If, as may be suspected, this comes from a readjustment to meet conditions as they exist; to make a profit from lesser volume, then the depression has been a boon, because better times are on the wing and the dealer who can make a profit on present operations can make real money when prosperity once more holds sway.

Twenty Million of Them

HENRY FORD made the exit from the production line of the twenty millionth Ford car a gala occasion at the Rouge plant the other day. The two Fords and other officials of the company met the distinguished infant at the end of the line, drove it to the Ford home and then started it on a round of visits to Ford dealerships all over the country. Later it will rest in the Transportation Museum at Dearborn.

To have manufactured twenty million highway vehicles in twenty-eight years of industrial activity is enough to give Henry Ford a justly earned thrill. But beyond the mere manufacturing accomplishment, Mr. Ford must look with even more satisfaction at the tremendous influence which these twenty million highway vehicles have had upon the development of modern life, particularly as we know it in the United States. Were he less modest, Mr. Ford could point to changes in the habits of a nation, to great areas developed, to families living in better surroundings than they ever could have hoped to achieve without the help of one or more of his ubiquitous little vehicles.

When the history of the first third of the twentieth century comes to be written, as history, and not as current events, we have an idea that Henry Ford will be placed in the first rank of those who influenced what is, to us, modern life.

Watch Costs, Push Service Sales And Merchandise Used Cars For 1931 Success

By N. E. M'DARBY
(Vice-President in Charge of Sales of Auburn)

IN my opinion distributors and dealers throughout the country have a great many things to watch this year. They must watch their overhead very carefully, just the same as they did last year, and not let expense creep in that is not absolutely essential to the proper running of their business.

They must build up their service departments and secure a larger percentage of the service on the new cars they sell than heretofore. This can be done only by rendering efficient and courteous service at a reasonable charge. They must give more attention to the sale of accessories because they are the logical men to sell the purchasers of new cars items such as tires, mirrors, clocks, metal tire covers, etc.

Used cars, as always, will be a problem to those dealers who have not learned to properly merchandise them. The first requisite and the one that everything depends upon is buying them right, then put them in A-1 mechanical shape and also make them attractive to the eye.

This year of 1931 is going to be a difficult year, but those distributors and dealers who learned their lesson in 1930 and have merchandise to sell that represents an outstanding value should come through with fair volume and fair profit.

CLAIRE L. BARNES AGAIN ELECTED PRESIDENT OF HOUDAILLE-HERSHEY

Detroit, April 16.—Claire L. Barnes was re-elected president of Houdaille-Hershey Corporation following the annual meeting of stockholders. Other officers were elected as follows: Fred L. Flanders, executive vice-president and general manager; Charles Getler and George V. Foy, vice-presidents; M. D. Harrison, vice-president and treasurer, and Melville C. Mason, secretary.

Directors elected were: Claire L. Barnes, Thomas J. Bosquett, Sandford Brown, Paul H. Davis, Fred L. Flanders, Fred W. Frazier, Charles Getler, Laurence O. Gordon, M. D. Harrison, Charles W. Hills, Jr., and Melville C. Mason.

NEW YORK CAR DEALERS PLAN GOLF TOURNAMENTS

New York, April 16.—All arrangements have been completed for the 1931 golf activities of the Automobile Merchants Association of New York, Inc. The first tournament of the season will be held on Thursday, April 23, at the Bonnie Briar Country Club, Larchmont, N. Y.

Very attractive prizes have been purchased for the opening event by the golf committee, with its chairman, C. H. Larson of the Cutting Larson Company; vice-chairman, Fred J. Ryan of Fred J. Ryan, Inc., C. H. Jennings of C. H. Jennings Corporation and A. G. Southworth of Glidden Buick Corporation.

During the past seven years these tournaments, which are held once a month from April to October, inclusive, have been an outstanding activity of the association.

BLOOMFIELD A. D. A. SEES CHRYSLER MOVIES

Bloomfield, N. J., April 16.—Moving pictures of the new Chrysler performing in the town of Bloomfield, and several other views of interest to the automobile trade, all taken locally, were displayed at the regular meeting of the Bloomfield Dealers' Association. The pictures and camera were the property of E. C. Mehrhof, Jr., of Mehrhof Motors. Mr. Mehrhof plans to use these films in his own showroom.

JAMES E. DOANE

Buffalo, N. Y., April 16.—James E. Doane, pioneer in the organization of the H. H. Franklin Manufacturing Company, Syracuse, and at one time general sales manager, died this week at his home in this city.

COMING EVENTS

APRIL

11-19—**Detroit, Mich.** Aeronautical Chamber of Commerce convention.
16-17—**Milan, Italy.** International Automobile Salon.
20-23—**Birmingham, Ala.** American Society of Mechanical Engineers, meeting.
28-May 1—**Atlantic City, N. J.** United States Chamber of Commerce, convention.

MAY

4- 9—**Charlotte, N. C.** Good Roads Convention.
4- 9—**Washington, D. C.** International Chamber of Commerce, convention.
7- 8—**Milwaukee, Wis.** Production meeting Society Automotive Engineers.
9-Aug. 9—**Berlin, Germany.** International Garage Exposition.
13-14—**Tulsa, Okla.** American Petroleum Institute, first mid-year meeting, Mayo Hotel.
15-16—**Detroit, Mich.** Society of Automotive Engineers, nineteenth aeronautical meeting, Book-Cadillac.
27-29—**New York City.** National Foreign trade Council.

JUNE

8-12—**Chicago, Ill.** Radio Manufacturers' Annual Show.
15-18—**Madison, Wis.** American Society of Mechanical Engineers, Oil and Gas Power meeting.
14-19—**White Sulphur Springs, W. Va.** Annual summer meeting, Society of Automotive Engineers.
22-26—**Chicago, Ill.** American Society for Testing Materials, annual meeting

SEPTEMBER

26-Oct. 2—**Atlantic City, N. J.** Annual meeting, American Electric Railway Association.

NOVEMBER

10-12—**Chicago, Ill.** Annual meeting, American Petroleum Institute, Hotel Stevens.

Contemporary Comment

THE automobile has been a big factor in the country's progress in the last twenty years. Without it, many more persons would be idle. Some say the automobile gives employment directly and indirectly to 10,000,000 persons.

Its development has been largely responsible for the rapid growth of the steel industry, and without it the oil industry would be back many years. It has been a big contributor to the growth of copper, electric, lumber, cotton and other industries making products that go into the construction of automobiles.

While railroads complain about the automobile taking their business, yet that industry is one of the largest customers of the railroads. Hundreds of thousands of cars annually are used to transport freight to and from the big automobile plants. Additional thousands of cars are needed to transport iron ore, lumber, cotton, glass and other materials to plants that make parts and equipment for the automobile.

It is estimated that car owners in 1931 will pay taxes on their automobiles approximating $1,000,000,000, a new high record. Some states that continue to raise the tax on gasoline have not yet learned that the automobile industry is no longer a pleasure industry, but one that has been responsible for a great part of the country's industrial growth over the last quarter of a century.—**Broad Street Gossip.**

* * *

ANYBODY can make money in good times. It takes the bad times for a man to show his qualifications. If I could make money only in the gala times, I wouldn't consider myself much of a dealer. Watch your business, stick with it, and above all, get more of a kick out of it than you do out of anything else. Then you can't help but be successful.—**John Hettche in Ford Dealer & Service Field.**

* * *

ON every hand there are indications that we are rapidly passing through the so-called "Age of Steel" and are entering a new era, which might be designated as the "Age of Alloy Steel" or, to be more general, the "Age of High Strength Materials." For many years research metallurgists and engineers have been painstakingly investigating the effect of various alloying elements on the physical properties of steel and other metals. Many important discoveries have already been reduced to practice and placed in production, with the result that the design engineer today has at his command an ever-increasing range of metals having properties that were unobtainable a few years ago.

Commercial production of these new high-strength alloys has served to focus attention in many fields on the desirability of eliminating excess weight. In certain industries, such as aircraft, this factor has, of course, been of primary importance. This industry was one of the first to standardize on high strength metals. It soon became evident that only through the use of welded construction could the high strength materials be used with full efficiency. This means, first, that in order to use these new materials effectively the design engineer must become familiar with the principles of welded construction and, second, that the welding industry must co-operate in developing the proper technique for welding each new material. In the latter connection it is interesting to note the tendency to consider weldability as a desirable characteristic in developing new alloys.—**Oxy-Acetylene Tips.**

New Profits in Delivering Building Materials

G. M. REPORT CITES METHODS OF BETTERING SERVICE, INCREASING PROFIT

In view of the opening of the spring and summer and building season at this time and the anticipated marked increase in public works, this report of a survey conducted by the General Motors Truck Company, Pontiac, Mich., covering the profits from delivery of building materials is especially timely. Automotive Daily News is pleased to present this entire report in serial form beginning with today's issue. Complete text of this report in pamphlet form is available at all General Motors Truck Company's dealer and distributorships.

THE building material and supply dealer of recent years has taken great forward strides in better, more aggressive management of his business. Competition for the consumer's dollar has been keen. For example, statistics show that more consumer dollars have been spent in the purchase of automobiles in the past five years than have been spent in the building or remodeling of homes. Radios, speculative investments, mechanical refrigerators, and other items have all been competing against the building material supply dealer's just claim for a fair share of the consumer's dollar.

Competition within the industry also has stimulated the independent dealer toward more aggressive activity. Ready-built homes and mail-order competition have multiplied their sales many times over. Moreover, these competitors are now establishing definite relationships with the local contractor and carpenter, whose influence is always a large factor in determining what dealer will eventually receive the consumer's building dollar.

As a result, recent years have seen successful supply dealers of all types making special efforts along two equally important lines:

(1) More aggressive selling or merchandising effort and (2) systematic effort to reduce costs of doing business.

Truck Operation Vital to Both Activities

The survey which preceded the writing of this report brought out a number of facts in connection with these two types of aggressive activity. The most significant facts are these:

Prompt, reliable delivery of materials to the job is a vitally important item in winning and holding the good-will of both the contractor and consumer customer.

The largest single item of expense in the majority of building material supply yards is the item of truck operation or delivery service. In the average yard, truck expense constitutes 30 per cent. to 50 per cent. of the total cost of doing business.

Each of these facts points clearly and unmistakably to the need for sound truck operation in the building and supply yard. Winning and holding customers means deliveries must be prompt and reliable; and profitable management demands constant watchfulness over truck costs.

The purpose of this report is to point out the methods that successful dealers are using to provide better delivery service and, at the same time, reduce truck operating costs.

BETTER MANAGEMENT IS NEEDED

AT first glance, it may seem that improved service and lowered costs in truck operation are two directly contrasting goals. All too often, the operator of trucks thinks of improved service as demanding a greater outlay for trucks. And conversely, he believes that economies in operation can only be accomplished at the expense of good delivery service.

Facts uncovered during this survey point clearly to an opposite conclusion. To be sure, any dealer can insure against delayed deliveries by purchasing more trucks, so that extra equipment is always on hand for the rush delivery. And any dealer can economize by the simple solution of getting rid of some of his trucks and taking a chance on being "caught short" when the contractor wants materials. But during this survey it was almost always found that dealers whose service was notably prompt and effective were the same dealers whose cost per ton for delivery was lowest. And those dealers provided good service at low cost simply by watchful, effective truck management.

Lower costs and better service go hand in hand when trucks are managed soundly.

Three Simple Fundamentals

Perhaps the easiest way to illustrate the difference between profitable truck management and costly truck management is to take a very common type of situation found in the average building material yard. One or two trucks, in the average yard, are kept at work a large part of the time. They are usually the relatively new trucks that drivers like to use and that seem to get deliveries out most satisfactorily. Those trucks run up a great deal of mileage in the course of a year, and the operating expense is high. But they also produce a great deal of work, and the cost per ton delivered is low.

HOW BETTER MANAGEMENT LOWERS COST PER TON

One Month's Operation	Truck A*	Truck B	Truck A's Advantage
No. of working hours	205	92.5	112.5
No. of trips per month	150	50	100
Total mileage	950	350	600
Total tons hauled	450	150	300
Total operation cost	$301.50	$252.25	....
Cost per mile	$ .317	$.7207	$ .4037
Cost per ton	$ .67	$1.68	$1.002

*Truck A, working a greater number of hours daily, delivering a greater number of loads of materials, operated at a saving of $1.002 per ton over Truck B.

Other trucks are left standing idle. In dull periods they are used only for special, rush deliveries—often less than full loads. The result is high cost per ton of materials moved.

The accompanying illustration, for example, shows the record of two three-ton trucks in one dealer's service. Notice that the dollars and cents operating cost of Truck A is high.

But its hours of work and tons of materials moved are also high, and the result is lower cost of operation.

Putting the delivery fleet operation on a sound basis—whether the dealer owns one truck or a hundred trucks—means putting the entire fleet as nearly as possible on the basis of the one or two trucks which accomplish the most work. Of course, it is not possible to keep every truck busy all of the time in the average yard. But sound management aimed at profitable operation means every dealer should be constantly alert to these three needs:

1. Better use of time; 2. Better planning of deliveries; 3. More thorough planning of truck purchases.

(To Be Continued)

TRUCK EXPENSE IS IMPORTANT

For every dollar of net profit cleared in a typical building material supply concern during 1930, approximately

50¢ were spent for insurance, taxes and rent

60¢ were spent for office expense, depreciation, and repairs

$1 + $1 + 67¢ were spent for wages of yard employees

$1 + $1 + 96¢ were spent for office and executive salaries

$1 + $1 + $1 + $1 + 33¢ WERE SPENT FOR TRUCKS and DRIVERS

The building material supply dealer's greatest opportunity for lowering his cost of doing business lies in better truck management.

LARGE ROAD JOBS AID EMPLOYMENT IN MIDDLE WEST

Chicago, April 16.—A great impetus in employment in this area is assured by announcement made today of the awarding of huge contracts for cement to be used for highway construction in Illinois and Wisconsin. The contracts call for more than 6,000,000 barrels, of which 5,000,000 have been bought by Illinois and 1,370,856 by Wisconsin, according to figures released. In addition, Cook county recently purchased 750,000 barrels, bringing the total to 7,120,856 barrels.

The contracts exceed by a considerable amount those placed at this time last year, when Illinois bought 4,000,000 barrels and Wisconsin 1,560,000 barrels. The tabulation of awards shows that the following companies shared in the orders:

Illinois—Marquette Cement Manufacturing Company, Universal Atlas Cement Company, International Cement Corporation, Lehigh Portland Cement Company, Madusa Portland Cement Company, Alpha Portland Cement Company, Dewey Portland Cement Company and Missouri Portland Cement Company.

Wisconsin—Lehigh Portland Cement Company, Manitowoc Portland Cement Company, Petoskey Portland Cement Company and Marquette Cement Manufacturing Company.

Aside from the close connection between highways and motor vehicles, automobile dealers here are expressing unusual interest in the contracts because of stimulation to their business through added employment in the cement manufacturing plants and in the building of roads. Extremely favorable weather conditions throughout the winter are taken to indicate that shipments of cement will be rushed and that the road construction activities will begin at the earliest possible date.

PHILADELPHIA GROUP RE-ELECTS DIRECTORS

Philadelphia, April 16.—The Philadelphia Automotive Trade Association, at a postponed meeting held at its headquarters, 715 North Broad St., unanimously elected the following directors to succeed themselves for a three-year term: J. E. Gomery, Gomery-Schwartz Motor Car Company, 128 North Broad St.; W. G. Herbert, Herbert Brothers, 1409 North Broad St., and Robert B. Parker, Packard, Inc., 3223 North Broad St.

The following active members were elected an admissions committee: J. E. Gomery, P. I. Harper, Harper & Harper, 1515 North Broad St.; Jo G. Roberts, Roberts Nash Motor Company, 1235 North Broad St.; H. L. Peterson, Marmon Philadelphia Company, 667 North Broad St., and S. S. Thornton, Thornton-Fuller Automobile Company, 24th and South Streets.

PHILLIPS PETROLEUM TO MARKET LEE TIRES

New York, April 16.—Phillips Petroleum Company has concluded arrangement with Lee Rubber and Tire Corporation whereby stocks of Lee tires and tubes will be carried in the 1,600 service stations operated by Phillips Petroleum in the sixteen states in which the company has marketing facilities. A plan for the sale of Lee tires and tubes will also be offered to the 8,500 dealers in Phillips products.

PACIFIC NORTHWEST TRUCK OPERATORS HOLD CONVENTION

Seattle, Wash., April 16.—With an attendance of over 100 motor truck operators from three states, Washington, Idaho and Oregon, as well as some from British Columbia, the ninth annual convention of the Washington Motor Freight Association was held here this week.

Principal addresses were devoted to business matters, legislation and operation details.

Leading speakers were: Claire Bowman, director of Washington Department of Labor and Industry; Officer Coughlin of state highway patrol; C. R. Longeran, chief of traffic division, Washington Department of Public Works; Fred K. Baker, director of Washington Department of Public Works; Dean S. J. Conn, College of Business Administration, University of Washington; Prof. C. S. Dakan, College of Business Administration, University of Washington; M. T. McIntyre, field deputy, State Tax Commission; L. E. Sutton, Pacific Northwest operating assistant, Associated Oil Company; James P. Neal, attorney-at-law; R. H. Culbertson, traffic manager, Pacific Motor Transport; John Condon, the Condon Company, Inc., and A. D. Martin, Northwest representative of Ethyl Corporation of America.

Joe G. Ryan, president, gave one of the leading addresses of the convention. He said in part:—

"It is true that during the last year many changes have taken place in our industry. Consolidations have been formed primarily to cut operating costs, decrease rates and give more frequent and better service. As a result of these mergers, the number of certificates of public convenience and necessity have decreased. Many of the active members heretofore have faded out of the picture. It is necessary that we cope with these conditions. Our fight is for the preservation of the transportation system which we are striving earnestly to maintain. The association has welded together the entire industry in this state. It is of immense advantage to the state officials, the Legislature and the public generally, to deal with a unified, responsible body like ours, which expresses the viewpoints of the industry as a whole."

SINCLAIR TRANSFERRING TRADE MARK TO VACUUM

New York, April 16.—E. W. Sinclair, president of the Sinclair Refining Company and Charles E. Arnott, president of the Vacuum Oil Company, announced yesterday that under an agreement recently entered into between the two companies Sinclair is transferring to Vacuum its rights here and abroad in the trade-mark "Mobiline." Sinclair acquired the trade-mark when it purchased the Union Petroleum Company of Philadelphia in 1919. The trade-mark had been owned and used for years by that company and since by Sinclair as a brand of its Pennsylvania motor oils.

With the further extension of Sinclair's distribution of Pennsylvania motor oils, it was felt that the similarity between the word "Mobiline" and Vacuum's well-known trade-mark "Mobiloil" might lead to confusion to the public. Hereafter Sinclair Refining Company will market its Pennsylvania motor oils under the name "Sinclair Pennsylvania Motor Oils."

BACON FELT COMPANY COMPLETES REORGANIZATI

Winchester, Mass., April 16.—Following a complete reorganization the new executives of the Bacon Felt Company, here, are announced as follows: C. F. Bacon, president; E. T. McCulloch, vice-president and treasurer. Robert F. Bacon, who has acted in the capacity of president and treasurer for several years, is no longer connected with the company in any way.

Production--Engineering--Factory-

Detonation and Vapor Lock Discussed at Opening of A. P. I. Mid-Year Meeting

St. Louis, Mo., April 16.—Laboratory methods for measuring the knocking tendency of commercial gasolines used in automobile engines are being perfected through the development of standardized testing apparatus. Dr. H. C. Dickinson, United States Bureau of Standards, related the progress in the problem of accurately measuring fuel knock ratings before the opening session of the American Petroleum Institute's division of refining at the Statler Hotel here yesterday.

A comprehensive series of tests, to be started during April in fifteen co-operating laboratories, will employ standardized procedure and equipment developed by the Co-operative Fuel Research Committee, which is supported by the Federal government and the petroleum and automotive industries, Dr. Dickinson said. Two pure compounds, normal heptane and iso-octane, will be used as the standards of known knock rating. Knock ratings will be expressed in octane number, the octane number of the blend of two standard substances being numerically the percentage by volume of iso-octane which it contains. The octane number of a fuel will be that of the blend of the two standards it matches in knock value when tested by an approved method. It is expected the octane number rating generally will replace, both in this country and Europe, the various knock ratings, such as benzol equivalent, previously employed.

Standardization of a test engine, Dr. Dickinson explained, has progressed to the point where an experimental machine is now undergoing final check tests. Of normal vehicle size, it has a cooling system which automatically keeps temperature nearly constant, a variable compression ratio and a special carburetor which permits instantaneous change to any of four fuels. Preparation of standardized test procedure, regarded as most difficult, was said to be nearing completion. It provides for determining the degree of accuracy with which such factors, among others, as engine speed, spark timing, mixture ratio, air and jacket temperatures, air humidity and general engine conditions, must be controlled.

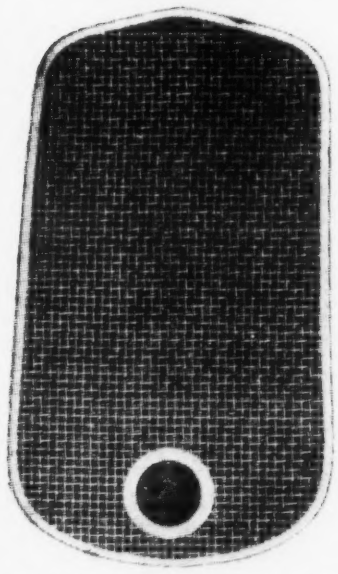
It is believed that hereafter the anti-knock characteristics of commercial motor fuels, described and expressed variously by their manufacturers, definitely can be determined through the standardized tests and the results of the measurement made accurately comparative. Dr. Dickinson declared that such measurements, means of making which have been studied since 1918, are likely to be of increasing importance because of the rapid changes in motor design, and, consequently, in fuels required to meet the motoring public's demand for increased power. Automotive engineers have sought to answer the demand by increasing compression ratios, which permit of a greater power output on less fuel, but cause knocking whenever temperatures and carbon deposits increase. Development of anti-knock gasolines to overcome the difficulty have led chiefly to the use of still higher compressions and a recurrence of the knocking problem. With the knock-eliminating abilities of fuels known, however, it may be possible so to adjust motor design and fuel characteristics that knocking, to a degree, will be overcome.

Find Cure for Vapor Lock

Vapor lock, or the boiling of gasoline in the fuel feed systems, causing stoppage of the motor in recently built cars, may be eliminated by altering the vapor pressure of the gasoline or the design of fuel feed lines, it was said by Oscar C. Bridgeman, also of the Bureau of Standards. Two years' study of the

(Continued on Page 12)

BILTMORE MAKING RADIATOR GRILLES AND TIRE BANDS



BILTMORE radiator grille for Fords

The Biltmore Manufacturing Company, Cincinnati, O., is now manufacturing a line of radiator grilles and chrome plated tire bands.

The radiator grilles follow the contour of the radiators for which they are made. They are heavily copper-plated, over which nickel and finally chrome are plated and polished.

PINES BATTERY FILLER HAS FLASHLIGHT FEATURE

Chicago, April 16.—Pines Winterfront Company will shortly be offering to the automotive trade the "Lite-way," a handy battery filler. It is a portable device embodying an electric flashlight designed for use in servicing storage batteries with distilled water.

WISCONSIN AXLES

Built just the way you would like to build them for your own use.

WISCONSIN AXLE CO.

OSHKOSH WISCONSIN

CHEMISTRY DEVELOPS FUELS FROM COAL

"Coal, through its development as a source of gasoline, lubricating oils and other essential commodities, will become the most important raw material ever available to chemical industry," it is declared in a research report to the Engineering Foundation by Chaplin Tyler, research supervisor of the Du Pont Amonia Corporation, Wilmington, Del.

When distilled, coal yields, among other materials, benzol, raw material for various organic syntheses and a motor fuel of valuable anti-knock properties.

"Starting with coal, proceeding thence to water-gas—largely hydrogen and carbon monoxide—we have a material that is the immediate starting point in the synthesis of ammonia, of alcohols and of motor fuels. Under suitable conditions of heat and pressure the hydrogen derived from water-gas can be combined with coal itself, thus obtaining synthetic gasoline and other hydrocarbon oils comparable in utility with the present products from petroleum.

"The initial coal hydrogenation studies specifically should be credited to the Kaiser Wilhelm Institute for Coal Research in Mulheim-Ruhr, Germany.

"In these laboratories was conceived the idea of adding hydrogen molecules to the solid hydrocarbons of coal, thus obtaining liquid hydrocarbons similar to the fractions of petroleum. Hydrogen is combined with the powdered coal at elevated temperatures and at a pressure of several hundred atmospheres.

"The inherent mechanical problems are extremely difficult. The coal is introduced into the pressure or reaction chamber in the form of paste, made by incorporating the powdered coal with some of the heavy oil produced in the reaction. This paste is actually pumped into the system, and in similar manner the ash and heavy oils resulting from the reaction are removed.

"Separation of this crude oil into its constituents is accomplished in the same manner as in the treatment of petroleum. This process of hydrogenating coal has not yet been exploited generally because of the present surplus of petroleum in nearly all parts of the world. However, the Interessen Geminschaft Farbenindustrie (commonly known as the German dye trust) has expended millions of dollars on the process, which is now in production on a large factory scale.

"Little imagination is required to forecast the economic and political significance of coal hydrogenation. Countries that do not possess adequate supplies of petroleum and gas will be enabled to become self-sufficient in motor fuels and oils. Most important of all, however, future generations in all countries need not fear that the possible eventual decline of petroleum resources will cause difficulties and inconvenience.

A. S. T. M. SPONSORS TESTING APPARATUS FOR FIRST TIME

The American Society for Testing Materials will sponsor, for the first time in its history, an exhibit of testing apparatus and machines in conjunction with the annual meeting of the society to be held at the Stevens Hotel, Chicago, June 22-26.

The exhibit is limited to equipment and apparatus used in the testing of materials and products, and recording and control equipment which is used in testing.

A feature of the exhibit will be the participation of certain of the society's committees, some of which have signified their intention of showing apparatus developed for special tests in conjunction with the work of these specific committees.

Characteristics of Shock Absorbers and Chassis Spring Damping

By FRED E. ULIERY

Research Department, Studebaker Corporation of America

The following, in part, is the fourth and concluding installment of a paper presented before a recent meeting of the Indiana section, Society of Automotive Engineers at Indianapolis.

The use of a pop-valve is a compromise. It is used to protect the working parts from excessive stresses, but, more especially, to reduce the effect of temperature changes on the ride. The maximum link force that is exerted, even when the shock absorber is not immune to changes in temperature, the link velocity below which only orifice control is obtained, varies with the viscosity of the oil, which in turn varies with the temperature. Thus at low temperatures the pop-valve opens for small movements and a constant damping force is obtained for both large and small oscillations. If the valve spring pressure is made large enough so that most of the oscillatory energy of a large net resultant spring deflection is dissipated at the first oscillation, then the boulevard ride is stiff at low temperatures. If some of the energy absorption capacity for large deflections is sacrificed, and a lighter pop-valve spring used, the link force corresponding to it is sufficiently low that the over-control at low temperature on the boulevard is not noticeable to most people. However, at high speeds and on rough roads, the link force is limited, and the energy that can be dissipated is only proportional to the deflection, while the energy input varies as to the square of the spring deflection. If several impulses are encountered in resonance, very large oscillations are produced. This condition may sometimes be noticed when a car equipped with this type of shock absorber passes over a multiple railroad crossing.

This type of shock absorber has proven very popular. Seasonal adjustments are not necessary and a good ride is obtained for average conditions. However, it is very significant that something is sacrificed when a pop-valve is used, because a great many people prefer shock absorbers with only orifice restriction, even though seasonal adjustments are necessary.

Still another type of spring damping which has been sadly neglected and which should receive more consideration is inertia damping. With this form of damping the body movements are restrained by forces directly proportional to the body accelerations, which means that the damping forces are properly proportioned to the forces causing the accelerations and act in proper phase to restrain them.

Fig. 5 shows how this form of shock absorber would function. Consider the body of the car pulled down and released. The chassis springs act on the body, causing it to accelerate in an upward direction. This acceleration of the body causes the inertia weight, A, to hold the valve to its seat with a force proportional to the acceleration. A corresponding fluid pressure is built up in chamber, B, and a link force obtained which is proportional to that causing the oscillation. The bump side acts in a similar manner for accelerations in the downward direction. Naturally, there is no action in the negative accelerations.

A single-acting inertia shock absorber was put on the market several years ago. Those who tested the device were very favorably impressed with the ride it produced, but the device itself was large and difficult to install. It was also premature; the demand for such a device was not sufficiently great.

Inertia damping also decreases the frequency of body oscillations.

A shock absorber with the most desirable features of the common types would have: (1) orifice restriction without a pop-valve; (2) a device to thermostatically control the orifice to compensate for viscosity changes in the oil; (3) piston displacement; (4) a light oil; (5) a means whereby the owner could intelligently modify the ride.

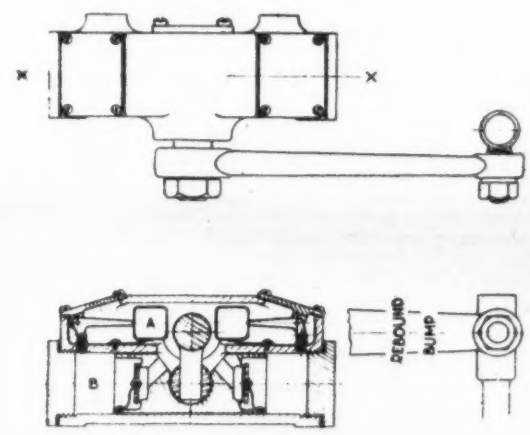


FIG. 5

NORTHWEST SECTION S. A. E. DISCUSSES COMBUSTION

Seattle, Wash., April 16.—"Flame" was the subject presented at the April meeting of the Society of Automotive Engineers, held at the New Washington Hotel, with Prof. Fred G. Baender of the Oregon State College presenting the discussion.

Properties and nature of flame or combustion, in internal combustion engines, was capably handled by the speaker, who at the outset gave the chemical reaction of burning, from the slow form of the rusting of iron to the very rapid form, noted in an explosion.

That the most important future development in the automobile engine would come, not mechanically, so much as in the use of "flameless combustion," in obtaining a compression ratio of 7 to 1 and higher, was his contention. To produce the higher compression ratios without detonation and without resorting to "doped" gasoline as fuels, was the problem. The dope was merely a subterfuge and not a solution.

"Between flameless combustion and ordinary combustion there is as much difference as there is between radio and the telephone," declared Mr. Baender.

Equipment - - - Developmen

Spark Plugs for Aircraft

By GEORGE M. PAULSON
Chief Engineer B. G. Corporation, New York city

The following, in part, is a paper presented before the nineteenth national aeronautic meeting, Society of Automotive Engineers, which is now in session in Detroit.

Many pages could be written on the subject of spark plugs in general, as the spark plug has been a very popular subject with inventors In discussing spark plugs for aircraft, I will deal mainly with those constructed with mica insulation, as they are in more general use with the large commercial operators and the government air services, particularly where the engines are large and the brake mean effective pressures are relatively high.

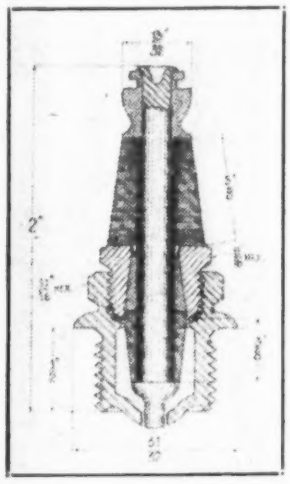


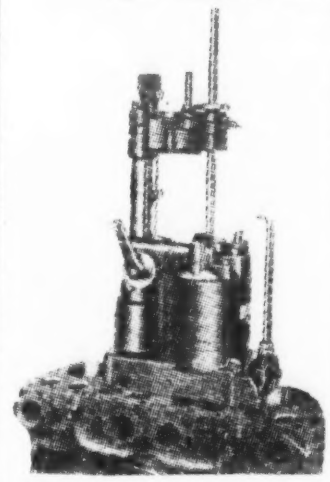
FIG. 1. Cross section of B. G. Hornet No. 4B-1 spark plug

Mica, due to its peculiar and unique qualities, readily lends itself to the manufacture of spark plugs. With its extremely high dielectric strength, mechanical strength, resistance to mechanical shock and machining qualities, it is the ideal insulating material for this work. Micas are silicates varying in color from colorless, pale brown or yellow, to green or black, and are characterized by their highly perfect cleavage. In the manufacture of the spark plug the insulation is built up of sheets of clear selected mica, split to approximately one and one-quarter thousandths of an inch in thickness, and rolled into the form of a tube or cigarette, which is protected at the top and bottom by mica washers punched from sheet mica (Fig. 1). The dielectric strength of the plug lies wholly in the cigarette, as the top and bottom washers serve only to protect the cigarette from mechanical injury, and the heat of combustion in the engine cylinder.

Due to the very high dielectric strength of mica, which may run well above 3,000 volts per mill, very little mica would be required to give a spark plug the necessary dielectric strength, provided the mica is

(Continued on Page 12)

TUNGSTEN-CARBIDE TIP USED WITH NEW BORING BAR



VAN NORMAN Per-fect-o boring bar

The Van Norman Machine Tool Company, Springfield, Mass., has just started making deliveries of a new cylinder reconditioning tool, which is known as the Van Norman Per-fect-o boring bar. A feature of this new machine is the use of a single fly-cutter tipped with tungsten carbide. The range of the tool is 2⅝ in. to 4½ in.

The cutting tool revolves at a speed of 20 r. m. p. and feeds down through the cylinder at a speed of 1¾ in. per min. The combination of high speed and the tungsten carbide tip, it is claimed, leaves a finish in the cylinder which makes immediate fitting possible. No abrasives become imbedded in the cylinder wall.

The cutter-head is fed by means of a rack and pinion. The cutting tool is mounted on a bar which revolves inside another non-revolving bar, and located just back of the cutting tool are four non-revolving expanding and contracting supports, which are expanded back of the cutting tool to afford a rigid support.

When centering and clamping the work, if No. 1 cylinder is to be bored, an expanding anchor is placed in No. 2 cylinder. Protruding from this anchor is a bolt with a large knurled head. The bar is placed in the cylinder over this anchor. The non-revolving supports are then run down into the cylinder to be centered. A special clamp, which eliminates the use of bolts, nuts, wrenches or straps, is then pushed into the base of the boring bar so that a slot in the clamp slides over the anchor bolt. The bar is then fastened securely to the block by tightening a handle on the clamp. When the non-revolving supports are released the tool is ready. After the cutting tool has reached a depth of approximately one inch, the non-revolving supports are expanded to give rigid support to the cutting tool.

A special micrometer and an iron disc charged with diamond dust for sharpening the tungsten-carbide tip, are included with the equipment. The price is $295.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

NEW EXTENSION LIGHT HAS SHOCK-PROOF HANDLE

The Ohio Parts Company has introduced a new extension light with a flexible rubber, shock-proof handle, which is claimed to be capable of resisting more than 10,000 volts and which acts as a shock absorber when the light is accidentally dropped.

The guard and shade are rust-proof. The light, complete with twenty-five feet of cord, is $8. Parts may be bought separately.

BROCKWAY-INDIANA WILL GROW

A profitable and bright future is ahead of Brockway-Indiana and those who associate themselves with it now.

Nothing is going to stop the growth and progress of this company, whose new policies are being made for the benefit of everyone from retail salesmen to the president.

If you want to learn more about the future plans of this organization, the profit possibilities of a dealer franchise—write

BROCKWAY MOTOR TRUCK CORP.,
Cortland, N. Y.

Cumulative New Commercial Car Registration Statistics, March, 1931

Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robin on Advertising Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Readers desiring county, city or town lists, or lists of owners in any given section, may obtain these by addressing any of these three companies. Some of this data has been published previously, but it is given here complete for the convenience of our subscribers. Commercial car registrations do not include buses.

Returns for today: Arkansas, Connecticut, Florida, Idaho, Maryland, Minnesota, Missouri, North Carolina, Ohio, South Dakota and Virginia

States	Autocar	Brockway-Indiana	Chevrolet	Diamond-T	Dodge	Essex	FWD	Fargo	Federal	Ford	G. M. C.	International	Mack	Paige	Relay	Reo	Republic	Rugby	Sterling	Stewart	Studebaker	Whippet	White	Willys	Willys-Knight	Miscellaneous	Totals	States
Arkansas			80		8					136	1	10											1				236	Arkansas
Conn.	3	2	117	5	29				4	222	5	24	19			11				5	9		5	4		5	469	Conn.
Delaware	1		36		2					53	2	9	2			2					1						103	Delaware
Florida		2	125		11				2	217	4	11	2								1		4			2	381	Florida
Idaho			28		5					87	2	7				2								6		2	139	Idaho
Illinois	3	6	470	23	63	1		4	9	655	28	130	3	2		12	1	2	7		22	6	7	9	1	38	1502	Illinois
Maryland	12		150	6	15			1	5	192	7	29	8	2		5				1	4		2	4	2	5	450	Maryland
Minn.			437	7	58		3	2	3	527	14	104	1		3	16	2	1			20	2	4	19	4	3	1230	Minn.
Missouri	2	9	655	29	77	2	2	3	7	609	22	111	6	2		10	3	3	4	1	15	3	3	8		9	1585	Missouri
Montana			78		8			1		76	1	28	2			4					4	1	2	3		1	209	Montana
North Car.		1	219		23					247	7	19	1			1							4	2		9	533	North Car.
Nor. Dak.		3	48	1	5					47	2	28									2			2			138	North Dak.
Ohio	4	11	319		48			2	6	557	20	96	7		1	14		1	6	14	19	2	8	26		33	1194	Ohio
So. Car.			103		14					112	1	5				2							1			5	243	S. Carol
S. Dakota			65	1	9					59	3	26	2			2		1			9						177	S. Dakota
Utah			77		10					124	9	7	4			3					4	1	2			4	245	Utah
Virginia	3	5	215		21	1				242	12	33	2		2		3			1	2		11	2		17	572	Virginia
West Va.			77	6	15					109	6	21		1							7		1	5			243	W. Virginia
Wisconsin		2	341	5	26		5	1	4	433	17	56		1		13		2	2	3	19	2	2	28		11	975	Wisconsin
Dist. Col.	3		34	1	2					93	4	11	1		1	1	1				2		1			2	157	Dist. of Col.
Totals	31	41	3674	84	449	4	10	14	40	4797	167	765	60	8	7	98	10	10	19	25	140	17	58	118	7	146	10729	Totals
Ark., '30			118		9					149	9	26	2	1		2		1					5	2			324	Ark., 1930
Conn., '30	8	4	108	5	43	4		5	8	253	14	31	17	3	2	23	1		1	9	4		9	2	1	12	557	Conn., '30
Del., '30	9	4	47		3					60	9	6	2			1				2							142	Del., '30
Fla., '30	1	5	123		6					276	7	10	3			6						2	4	1			444	Fla., '30
Idaho, '30			50		4					94		6	8			2		2					1	1		3	171	Idaho, '30
Ill., 1930	5	9	723	77	71	1		9	16	944	61	218	24	2	5	35	2		15	6		21	25		22	95	2386	Ill., 1930
Md., '30	9	13	221	12	26	2		3	14	356	21	44	15	1		20	2	1	2	6	7	3	14	2		15	809	Md., '30
Minn., '30		2	291	4	31			3	3	422	11	70			1	18		2			2	4	6	8	4	7	869	Minn., '30
Mo., 1930	9	23	1111	24	120	1		12	16	1228	47	208	5	8	1	30	6	4	1	8	11	43	9	38	5	43	3011	Mo., 1930
Mont., '30			98		3			3	1	135	5	43	1			4		2				6	1	6		1	309	Mont., '30
N. C., '30	8	1	240		23	1				239	4	47	2			9					1	1	11	1		1	539	N. C., '30
N. D., '30			68	3	5			4		80	2	34				1		1				2		5		1	206	N. D., 1930
Ohio, 30	6	16	493	5	57	3		9	9	856	59	109	5		2	32	4	4	4	9	1	25	50	10	8	37	1813	Ohio, '30
S. C., '30			129		9			1		121	4	3	1			1	1					1	2				273	S. C., 1930
S. D., '30			132		10			2	1	123	4	65	6			12		1				2		6	2	4	370	S. D., '30
Utah, '30			75		7					119	7	11				8		2				1	2			2	234	Utah, 1930
Va., '30	5	21	540		37			1	9	506	16	41	2			13	6			3		2	12	5		15	1234	Va., '30
W. V., '30		5	128	3	20	1		3		195	17	32			1	10				1			1	2	2	3	424	W. Va., '30
Wis., '30		4	482	11	36	1		5	14	543	22	80		1		24		1	3	7	2	12	4	18	2	26	1298	Wis., 1930
D. C., '30		1	34	2	6				3	63	7	3			1	8							1			2	131	D. C., 1930
Totals	60	108	5211	146	526	14	*	60	94	6762	325	1087	93	16	13	259	22	21	26	51	28	125	157	107	46	267	15624	Totals

*Carried in the Miscellaneous Column.

Major Specifications and Mechanical Details of 1931 Commercial Cars

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brakes	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Standard Tire Sizes Rear
*Am. La France Chief	2½	3650	Own	L	8	3¾x5	331.0	33.7	65@2100	G	G & O	Borg	Spic	Ross	Str	Vac	DR	Own	4	Tim	Wo	31.2	B4IM	—	156	6200	32x6	32x6D
*Am. La France Chieftain	3-4	5500	Own	L	8	4¼x5⅛	411.0	40.8	75@1800	G	G & O	Borg	Spic	Ross	Zen	Vac	DR	Own	4	Tim	Wo	38.8	B4IM	—	175	7200	36x8S	36x8D
Am. La France Big Chief	6	6725	Own	—	8	4½x6	——	48.6	50@1200	—	—	—	—	——	Zen	Vac	DR	Own	4	Own	2 R	32.8	——	—	226	10600	40x8S	40x8D
Austin	——	475	Own	—	4	2.2x3	——	7.8	——	—	—	—	—	——	Til	—	Aut	W-G	3	Sal	Sp	——	——	—	75	——	3.75x18	3.75x18
Autocar A	1½-2	3200	Own	L	6	4 x4¾	358.0	38.4	82@2400	G	Per	Long	Spic	Ross	Str	Vac	DR	Br-L	4	Own	Sp	27.9	LO4ID	460	150	5060	34x7	34x7
Autocar D	2-2½	3500	Own	L	6	4 x4¾	358.0	38.4	82@2400	G	Per	Long	Spic	Ross	Str	Vac	DR	Br-L	4	Own	2 R	33.5	LO4ID	460	150	5300	34x7	34x7D
Autocar SH	2½-3	4300	Own	L	6	4½x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	44.0	O2IM	328	114	6770	34x7	34x7D
Autocar SCH	2½-3	4300	Own	L	6	4½x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	44.0	O2IM	328	157	6860	34x7	34x7D
Autocar H	3	4100	Own	L	4	4½x5½	350.0	32.4	45@1450	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	48.6	O2IM	328	114	6770	34x7	34x7D
Autocar HS	3½	4600	Own	L	4	4½x5½	350.0	32.4	45@1450	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	54.3	O2IM	516	114	7900	40x8	40x8D
Autocar SHS	3-3½	4800	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	54.3	O2IM	516	114	7900	40x8	40x8D
Autocar SCHS	3-3½	4800	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	54.3	O2IM	516	157	8180	40x8	40x8D
Autocar TEA	3-3½	5350	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	12	Own	2 R	101.1	LO4ID	602	192	8900	36x8	36x8D
Autocar TFA	3½-5	6100	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	12	Own	2 R	101.3	LO4ID	602	192	9300	38x9	38x9D
Autocar C	3½-5	5500	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	51.7	O2IM	516	172	9500	42x9	42x9D
*Autocar CG	5	8250	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	12	Tim	Wo	120.0	T6IA	720	196	13000	36x8	36x8D
Autocar F	7½	6800	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Br-L	Spic	Ross	Str	Vac	DR	Br-L	7	Tim	Wo	94.0	LT4DV	674	173	11000	36x7S	40x8SD
*Autocar G	10	9000	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Br-L	Spic	Ross	Str	Vac	DR	Br-L	7	Tim	Wo	100.0	T6IA	720	171	13000	36x8	36x8D
Brockway 60	*6000	995	Con	L	6	3¾x4	214.7	27.3	61@3000	C	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	3	Col	Sp	19.8	B4IM	297	132	3200	30x5	30x5
Brockway 65	6500	1195	Con	L	6	3¾x4⅝	248.2	27.3	65@2700	C	G & O	Borg	Spic	Ross	Zen	Vac	Aut	Br-L	3	Col	Sp	21.3	C4IM	244	137	3400	30x5	30x5
Brockway 75	7500	1290	Con	L	6	3¾x4⅝	248.2	27.3	65@2700	C	G & O	Borg	Spic	Ross	Zen	Vac	Aut	Br-L	4	Col	Sp	25.6	C4IM	244	137	3450	32x6	32x8
Brockway 90	9000	1525	Con	L	6	3¾x4⅝	248.2	27.3	65@2700	C	G & O	Borg	Spic	Ross	Zen	Vac	Aut	Br-L	4	Col	Sp	20.9	C4IM	292	149	3650	32x6	32x6
Brockway 120	12000	1990	Con	H	6	4 x4⅛	311.0	38.4	73@3400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	31.3	L4IH	353	156	5200	32x6	32x6D
Brockway 140	14000	2495	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	35.3	L4IHV	356	156	5500	32x6	32x6D
Brockway 141	17000	2935	Con	L	6	4 x4¼	326.3	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	46.2	L4IHV	356	170	6200	32x6	32x6D
Brockway 170	17000	3160	Con	H	6	4½x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	46.6	L4IHV	380	170	6800	32x6	32x6D
Brockway 175	17500	3660	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	G & O	—	Spic	Ross	Zen	P	Aut	—	5	Wis	2 R	45.3	L4IHV	380	170	7200	34x7	34x7D
Brockway 195	19500	3820	Con	H	6	4¼x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	49.5	L4IHV	471	170	7500	34x7	34x7D
Brockway 190	19000	4185	Con	H	6	4¼x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	78.6	L4IHV	471	168½	7625	34x7	34x7D
Brockway 220	22000	4560	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	50.7	L4IHV	546	170	8200	36x8	36x8D
Brockway 250	25000	5950	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	Long	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Tim	Wo	63.7	LT4IVA	664	182	10000	40x8	40x8D
Brockway 290	30000	7250	Con	L	6	4¾x5¾	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	95.0	T4IA	676	182	10750	38x7P	40x14S
*Brockway 640	40000	9700	Con	L	6	4¾x5¾	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	90.9	T4IA	864	212	14000	38x7P	38x10S
Chevrolet	½	355	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	3	Own	Sp	13.6	O4IM	101	109	1880	19x4.75	19x4.75
Chevrolet	1½	590	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	4	Own	Sp	33.4	O4IM	170	157	2890	30x5	30x5D
Chevrolet	1½	520	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	4	Own	Sp	33.4	——	—	131	2560	30x5	32x6
Commerce Series S 11	1	1600	Bud	L	8	3¼x4½	241.6	27.3	52@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Col	Sp	25.5	L4IH	297	142	3900	30x5P	30x5P
Commerce Series S 11	1½	1900	Bud	L	6	3⅛x4½	241.6	27.3	52@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Sp	29.2	L4IH	297	162	4300	30x5P	30x5DP
Commerce Series 40	1½	2990	Bud	L	6	3⅝x5	309.6	31.5	56@2000	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	4700	34x5P	34x5DP
Commerce Series S 11	2	3020	Bud	L	6	3⅛x4½	241.6	27.3	52@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Sp	29.2	L4IH	297	162	4500	32x6P	32x6D
Commerce Series 40	2	3240	Bud	L	6	3⅝x5	309.6	31.5	56@2000	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	4900	32x6	36x6D
Commerce Series 40	2½	3240	Bud	L	6	3⅝x5	309.6	31.5	56@2000	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	5100	36x6P	36x6D
Commerce Series 60	2½	4580	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Tim	Wo	63.0	L4IH	584	175	7000	36x6P	36x6D
Commerce Series 60	3	4680	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Tim	Wo	63.0	L4IH	584	175	7100	36x6P	38x7D
Commerce Series 80	3½	5250	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	98.2	——	—	175	8200	36x6S	36x6S
Commerce Series 80	4	5330	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	98.2	——	—	175	8400	36x6S	36x14S
Commerce Series 100	5	5830	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	95.0	——	—	175	9600	36x6S	40x14S
Day Elder 60	1	1195	Con	L	6	3⅝x4	214.7	27.3	61@3000	C	G & O	Borg	Spic	Ross	Zen	P	DR	W-G	4	Tim	Sp	36.3	B4IM	241	135	3200	20x6.00B	20x6.50B
Day Elder 85	1½	1645	Con	L	6	3⅜x4⅝	248.3	27.3	65@2700	C	Per	Borg	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Sp	42.3	L4IH	229	135	3750	20x6.00B	20x6.50DB
Day Elder 110	2	2095	Con	L	6	3⅜x4⅝	248.3	27.3	65@2700	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Sp	44.9	L4IH	306	156	4600	20x7.00B	20x7.00DB
Day Elder 130	2½	2895	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Sp	40.7	L4IH	354	150	6400	20x7.50B	20x7.50DB
Day Elder 160	3	3695	Con	H	6	4 x4½	339.3	38.4	82@2400	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Wo	36.1	L4IH	398	156	6600	20x7.50B	20x9.00DB
Day Elder 200	4	4295	Con	H	6	4 x4½	339.3	38.4	82@2400	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Wo	43.5	L4IHV	489	156	7400	20x9.00B	20x9.00B
Day Elder 240	5	5500	Con	H	6	4⅞x4¾	427.5	45.9	100@2600	C	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	4	Tim	Wo	50.8	L4IHV	520	162	9300	38x9P	38x9DP
*Day Elder 285	8	6000	Con	H	6	4⅞x4¾	427.5	45.9	100@2600	C	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	71.2	L6IHV	674	164	12000	20x8.25B	20x8.25DB
*Day Elder 315	10	7500	Con	H	6	4⅞x4¾	427.5	45.9	100@2600	C	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	79.9	TrIA	490	164	12500	20x9.00B	20x9.00DB
*Day Elder 402	12	9000	Con	L	6	4¾x5¾	611.4	54.2	127@2300	G	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	7	Tim	Wo	84.6	TrIA	490	164	14000	20x9.75B	20x9.75DB
Diamond T 216	1	695	Her	L	6	3⅜x4½	224.7	27.3	——	G	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Cla	Sp	——	L4IH	244	135½	3130	20x6.50B	20x6.50B
Diamond T 291	1½	1475	Her	L	6	3½x4½	268.0	29.4	60@2400	G	G & O	Borg	Spic	Ross	Zen	P	Aut	Cov	4	Cla	Sp	——	L4IH	279	156¼	4400	20x6.50B	20x6.50DB
Diamond T 303	2	1745	Her	L	6	3½x4½	298.0	33.7	67@2400	G	G & O	Borg	Spic	Ross	Zen	P	Aut	Cov	4	Cla	Sp	——	L4IHV	279	159¾	5000	20x7.00B	20x7.00DB
Diamond T 351	2½	2250	Her	L	6	4 x4½	339.0	38.4	74@2400	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	4	Tim	Sp	——	L4IHV	390	168	5600	20x7.50B	20x7.50DB
Diamond T 504	2½	2675	Her	L	6	4 x4½	339.0	38.4	74@2400	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	4	Wis	2 R	——	L4IHV	—	176½	6400	20x8.25B	20x8.25DB
Diamond T 506	2½	3000	Her	L	6	4½x4½	383.0	43.3	85@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	L4IHV	390	184	6400	20x8.25B	20x8.25DB
Diamond T 603	3	3300	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	G & O	Cov	Sup	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	L4IHV	478	169	7500	20x9.00B	20x9.00DB
Diamond T 606	3	3440	Her	L	6	4½x4¾	453.0	48.6	100@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	L4IHV	478	187½	7500	20x9.00B	20x9.00DB
Diamond T 759	4	4800	Her	L	6	4⅝x5¼	529.0	51.3	——	G	G & O	Cov	Sup	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	W4I	522	178	8300	22x9.75B	22x9.75DB
*Diamond T 801	4	4140	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	G & O	Cov	Sup	Ross	Zen	P	Aut	Br-L	7	Own	Wo	——	L6IHV	706	189½	8300	36x8P	36x8DP
*Diamond T 1200	6	5600	Her	L	6	4½x4¾	453.3	48.6	100@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	——	T4IA	—	190	11000	34x7P	34x7DP
*Diamond T 1600	8	6220	Her	L	6	4⅝x4¾	479.0	51.3	104@2400	G	G & O	Cov	Sup	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	——	T4IA	796	190	11700	36x8P	36x8DP
*Diamond T 1601	8	7500	Wak	L	6	5 x5¼	677.4	60.0	127@2000	G	G & O	Br-L	Sup	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	——	T4IA	796	194	12500	36x8P	36x8DP
Dodge Bros. UF 10	½	435	Own	L	4	3⅜x4¼	196.0	21.2	48@2800	G	Fed	Borg	Own	——	Car	P	DR	Own	3	Own	Sp	14.2	L4IH	114	109	1925	19x5.00	19x5.00
Dodge Bros. F 10	½	515	Own	L	6	3⅛x4⅛	189.8	23.4	61@3400	G	Fed	Borg	Un	——	Car	P	DR	Own	3	Own	Sp	14.2	L4IH	114	109	1975	19x5.25	19x5.25
Dodge Bros. U 1	¾	695	Own	L	4	3⅜x4¼	175.4	21.3	45@2800	G	Fed	Borg	Spic	Han	Car	Vac	NE	Own	3	Own	Sp	21.6	L4IH	189	124	2260	20x5.50B	20x5.50B
Dodge Bros. DA 1	¾	795	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	C	Fed	Borg	Spic	Han	Zen	Vac	NE	Own	4	Own	Sp	16.8	L4IH	189	124	2360	20x5.50	20x5.50
Dodge Bros.	1	795	Own	—	4	3⅜x4¼	——	21.0	45@2800	—	—	—	—	——	Car	Vac	NE	Own	3	Own	Sp	36.1	——	—	133	2590	20x6.00	32x6
Dodge Bros.	1	895	Own	—	6	3⅜x3⅞	——	27.3	63@3200	—	—	—	—	——	Zen	Vac	NE	Own	3	Own	Sp	33.4	——	—	133	2690	20x6.00	32x6
Dodge Bros. UF 30	1½	595	Own	L	4	3⅜x4⅜	196.0	21.0	48@2800	G	Fed	Borg	Cle	——	Car	P	DR	Own	4	Own	Sp	37.1	L4IH	120	136	2581	20x6.00	32x6
Dodge Bros. F 30	1½	695	Own	L	6	3⅛x4⅛	189.8	23.4	61@3400	G	Fed	Borg	Cle	——	Car	P	DR	Own	4	Own	Sp	37.1	L4IH	120	136	2631	20x6.00	32x6
Dodge Bros. F 35	1½	1425	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	G	Long	Borg	Cle	Han	Zen	P	DR	Own	4	Own	Sp	41.4	L4IH	311	140	3780	20x6.00	20x6.00D
Dodge Bros. F 36	1½	1485	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	G	Long	Borg	Cle	Han	Zen	P	DR	Own	4	Own	Sp	41.4	L4IH	311	165	3972	20x6.00	20x6.00D
*Dodge Bros. F 40	2	1995	Own	L	6	3⅜x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	Zen	P	DR	Own	4	Own	Sp	43.7	L4IH	350	150	5173	20x6.50	20x6.50D
*Dodge Bros. F 41	2	2085	Own	L	6	3⅜x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	Zen	P	DR	Own	4	Own	Sp	43.7	L4IH	350	165	5211	20x6.50	20x6.50D
Dodge Bros.	3	1845	Own	L	6	3⅜x4½	——	27.3	78@3000	—	—	—	—	——	Zen	Vac	NE	Own	4	Own	Sp	46.3	——	—	135	4235	32x6	32x6D
Dodge Bros.	3	1895	Own	L	6	3⅜x4½	——	27.3	78@3000	—	—	—	—	——	Zen	Vac	NE	Own	4	Own	Sp	41.4	——	—	165	4520	32x6	32x6D
Dodge Bros.	3	1945	Own	L	6	3⅜x4½	——	27.3	78@3000	—	—	—	—	——	Zen	Vac	NE	Own	4	Own	Sp	46.3	——	—	185	4715	32x6	32x6D
Dodge Bros. F 60	3	2645	Own	L	6	3⅜x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	Zen	P	DR	Own	4	Own	Sp	48.8	L4IH	416	146	5543	32x6	32x6D
*Dodge Bros. F 61	3	2575	Own	L	6	3⅜x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	Zen	P	DR	Own	4	Own	Sp	48.8	L4IH	416	170	5789	32x6	32x6D
*Dodge Bros. F 62	3	2695	Own	L	6	3⅜x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	Zen	P	DR	Own	4	Own	Sp	48.8	L4IH	416	195	5901	32x6	32x6D
Essex Com.	¾	445	Own	—	6	2¾x4½	——	18.2	——	—	—	—	—	——	Mar	Vac	Aut	Own	3	Own	Sp	17.8	——	—	110	1930	30x5	31x5.50
Federal D	1½	795	Con	L	4	3⅞x4½	200.5	24.8	48@2500	C	Long	Borg	Spic	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L4IH	377	131	3225	20x6.00	32x6
Federal E 6	1½	895	Con	L	6	3¼x4	215.0	27.3	66@2600	C	Long	Borg	Spic	Gem	Zen	Vac	DR	W-G	4	Cla	Sp	34.6	L4IH	377	132	3275	20x6.00	32x6
Federal F 7	1½	1525	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Pet	Gem	Zen	P	DR	Own	4	Tim	Sp	29.2	L4IH	437	132	3765	30x5	30x5D
Federal A 6	2	1855	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Opt	Ross	Zen	Vac	DR	Own	4	Cla	Sp	38.5	L4IH	450	151	4580	32x6	32x6D
Federal A 6 T	2½	2135	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Opt	Ross	Zen	Vac	DR	Own	4	Tim	Sp	41.3	L4IHV	659	151	4950	32x6	32x6D
Federal A 6 T W	2½	2360	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Opt	Ross	Zen	Vac	DR	Own	4	Tim	Wo	42.0	L4IHV	659	151	4950	32x6	32x6D
*Federal 2 D S W	2½-3	1050	Con	L	4	3⅞x4¼	200.5	24.0	48@2500	C	Long	Borg	Spic	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	566	140	3925	20x6.00	32x6
*Federal 2 E S W	2½-3	1150	Con	L	6	3⅝x4	215.0	27.3	60@2600	C	Long	Borg	Spic	Gem	Zen	Vac	DR	W-G	4	Cla	Sp	40.8	L6IH	586	145	3980	20x6.00	32x6
Federal T 10 B	2½-3	2740	Con	H	6	4 x4⅛	311.0	38.4	75@2200	C	Long	Borg	Opt	Ross	Zen	P	DR	Own	4	Tim	Sp	44.5	L4IHV	659	165	6550	34x7	34x7D
Federal T 10 W	2½-3	2915	Con	H	6	4 x4⅛	311.0	38.4	75@2200	C	Long	Borg	Opt	Ross	Zen	P	DR	Own	4	Tim	Wo	44.0	L4IHV	659	165	6550	34x7	34x7D
Federal U 6	3-3½	3880	Con	H	6	4 x4½	339.0	38.4	85@2200	C	Long	Borg	Opt	Ross	Str	P	DR	Br-L	7	Tim	Wo	64.6	L4IHV	767	165	7220	34x7	34x7D
Federal 4 C 6 A	4-5	4735	Con	H	6	4¼x4¾	381.0	40.8	90@2200	C	Long	Borg	Opt	Ross	Zen	P	DR	Br-L	7	Tim	Wo	72.2	L4IHV	894	192	8330	36x8	36x8D
Federal 4 C 6 A B	4-5	4960	Con	H	6	4¼x4¾	381.0	40.8	90@2200	C	Long	Borg	Opt	Ross	Zen	P	DR	Br-L	7	Tim	Wo	72.2	T4IA	921	192	8850	36x8	36x8D
*Federal U 6 S W	6	6000	Con	O	6	4¼x4¾	380.9	40.8	90@2200	C	Long	Borg	Opt	Ross	Zen	P	DR	Br-L	7	Tim	Wo	71.3	L6IHV	—	201	10300	34x7	34x7D
*Federal U 6 S W A B	6	6500	Con	O	6	4¼x4¾	380.9	40.8	90@2200	C	Long	Borg	Opt	Ross	Zen	P	DR	Br-L	7	Tim	Wo	71.3	TrIA	867	201	10300	34x7	34x7D
Federal X 4	7½	5085	Con	L	4	5 x6	471.0	40.0	61@1350	G	Long	Borg	Opt	Gem	Zen	Vac	AB	Br-L	7	Tim	Wo	110.9	T2IMV	603	162	9750	36x6S	40x14S
Federal X 4 R	7½	5810	Con	O	6	4¼x4¾	427.5	45.9	100@2200	C	Long	Borg	Opt	Gem	Zen	P	DR	Br-L	7	Tim	Wo	110.9	T2IMV	462	162	10000	40x8	40x8D
*Federal 4 C 6 S W	8	7500	Con	O	6	4¾x4¾	428.0	45.9	100@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Br-L	7	Tim	Wo	80.8	T6IA	867	231	12380	36x8	36x8D
Ford AA	1½	495	Own	L	4	3⅞x4¼	200.5	24.0	40@2200	G	Own	Long	Own	Own	Zen	Gra	Own	Own	4	Own	S-T	42.2	O4IM	358	131½	2723	20x6.00	32x6
Ford AA	1½	525	Own	L	4	3⅞x4¼	200.5	24.0	40@2200	G	Own	Long	Own	Own	Zen	Gra	Own	Own	4	Own	S-T	42.2	O4IM	358	157	2811	20x6.00	32x6
FWD H	1½	3325	Wis	H	4	4 x5	251.0	25.6	50@2000	G	Per	Detr	Blo	Ross	Zen	Vac	Eis	Cot	4	Own	St	38.1	O4M	252	121	5300	34x7	34x7
FWD H 6	2	3425	Wak	L	6	3⅛x4⅜	315.0	33.7	72@2500	G	Per	Br-L	Blo	Ross	Zen	Vac	Eis	Br-L	4	Own	St	35.0	O4XM	252	133	5500	34x7	34x7
FWD BH	2½	3900	Wak	L	6	3⅛x4⅜	315.0	33.7	72@2500	G	Per	Br-L	Blo	Ross	Zen	Vac	Eis	Br-L	7	Own	St	84.7	O4XM	252	137½	6000	36x8	36x8
FWD HH 6	2½	4000	Wak	L	6	3⅛x4⅜	315.0	33.7	72@2500	G	Per	Br-L	Blo	Ross	Zen	P	Eis	Br-L	7

Major Specifications and Mechanical Details of 1931 Commercial Cars

(CONTINUED FROM PAGE EIGHT)

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Transmission Make	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brakes	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
Gramm A X 4	1	795	Con	L	4	3⅜x4	200.4	24.0	50@2800	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	2900	20x6.00	20x6.50
Gramm A X 6	1	895	Con	L	6	3⅜x4	214.0	27.3	61@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	2900	20x6.00	20x6.50
Gramm B X 4	1½	895	Con	L	4	3⅞x4½	200.4	24.0	50@2800	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	3100	20x6.00	20x6.00D
Gramm B X 6	1½	995	Con	L	6	3⅜x4	214.7	27.3	61@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	3100	20x6.00	20x6.00D
Gramm B	1¾	1495	Lyc	L	6	3¼x4½	224.0	25.3	61@2900	G	Per	Own	Blo	Ross	Zen	Vac	Aut	Cov	4	Tim	Sp	34.3	L4IH	278	140	3800	20x6.50	20x6.50D
Gramm C	2	1795	Lyc	L	6	3⅝x4½	278.6	31.5	82@2600	G	Per	Own	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	31.0	L4IH	353	160	4820	20x7.00	20x7.00D
†Gramm C X	2	1095	Con	L	4	4⅛x4¼	227.0	27.2	55@2600	G	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	37.0	L4IH	452	131	3300	20x6.50	20x6.50D
Gramm C X	2	1295	Con	L	6	3⅜x4⅜	248.2	27.3	70@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	37.0	L4IH	452	131	3300	20x6.50	20x6.50D
Gramm D	2½	1995	Lyc	L	6	3¾x4½	299.0	33.7	90@2200	G	Per	Jon	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	33.0	L4IHV	339	160	5100	20x7.50	20x7.50D
Gramm E	3	2595	Lyc	L	6	3⅞x5	353.8	36.0	90@2200	G	Per	Own	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	35.0	L4IHV	659	160	5500	20x8.25	20x8.25D
Gramm E Y	3	3595	Con	H	6	4⅛x4¾	380.8	40.8	90@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	30.0	L4IHV	—	190	6750	20x7.50	20x7.50D
Gramm T-38	3	3595	Lyc	L	6	3⅞x5	353.8	36.0	90@2200	G	Own	Ful	Blo	Ross	Zen	P	Aut	Ful	4	Wis	2 R	45.0	OPX	—	153	7200	36x5S	36x10S
Gramm O-45	4	3995	Lyc	L	6	3⅞x5	353.8	36.0	85@2200	G	Own	Ful	Blo	Ross	Zen	P	Aut	Ful	8	Wis	2 R	75.8	OPM	—	153	7700	36x5S	36x12S
Gramm G Y	4	4345	Con	H	6	4⅜x4¾	428.4	45.9	100@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Wis	2 R	28.0	BW41M	—	210	7200	20x8.25	20x8.25D
Gramm G W	4	5175	Con	H	6	4⅜x4¾	428.4	45.9	100@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Wis	2 R	—	4IA	864	157	8900	20x9.00	20x9.00D
Gramm O-60	5	4745	Lyc	L	6	3⅞x5	353.8	36.0	——	G	Own	Ful	Blo	Ross	Zen	P	Aut	Ful	8	Wis	2 R	78.4	OPM	—	153	8800	36x6S	36x14S
Gramm H Y	5	6545	Con	L	6	4¾x5¾	611.4	54.1	127@2300	G	Per	Ful	Blo	Ross	Zen	P	Aut	Ful	4	Wis	2 R	25.2	4IA	—	236	9600	36x8	36x8D
Indiana 60	*6000	995	Con	L	6	3⅜x4	214.7	27.3	61@3000	C	G & O	Borg	Spic	Ross	Str	P	Aut	W-G	3	Col	Sp	19.8	B4IM	297	132	3200	30x5	30x5
Indiana 64	6500	1195	Con	L	6	3⅜x4⅝	248.2	27.3	65@2700	C	Long	Borg	Spic	Ross	Str	Vac	Aut	Br-L	3	Col	Sp	21.3	C4IM	244	137	3400	30x5	30x5
Indiana 74	7500	1290	Con	L	6	3⅜x4⅝	248.2	27.3	65@2700	C	Long	Borg	Spic	Ross	Str	Vac	Aut	Br-L	4	Col	Sp	25.6	C4IM	190	137	3450	32x6	32x6
Indiana 89	9000	1525	Con	L	6	3⅜x4⅝	248.2	27.3	65@2700	C	Long	Borg	Spic	Ross	Str	Vac	Aut	Br-L	4	Col	Sp	20.9	C4IM	292	149	3650	32x6	32x6
Indiana 111 XW	12500	1850	Her	L	4	4 x5	251.3	25.6	46@2000	G	McC	Borg	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	35.2	K2IM	270	120	3740	32x6	32x6D
Indiana 120	12000	1990	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	31.3	L4IH	353	156	5200	32x6	32x6D
Indiana 140	14000	2495	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	35.3	L4IHV	356	156	5500	32x6	32x6D
Indiana 141	17000	2935	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	46.2	L4IHV	380	170	6200	32x6	32x6D
Indiana 170	17000	3160	Con	H	6	4⅛x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	46.6	L4IHV	380	170	6800	32x6	32x6D
Indiana 175	17500	3660	Con	H	6	4⅜x4¾	427.5	45.9	100@2400	C	G & O	——	Spic	Ross	Str	P	Aut	—	5	Wis	2 R	45.3	L4IHV	380	170	7200	34x7	34x7D
Indiana 195	19500	3820	Con	H	6	4⅛x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	49.5	L4IHV	471	170	7500	34x7	34x7D
Indiana 190	19000	4185	Con	H	6	4⅛x4¾	380.9	40.8	89@2400	C	Long	Borg	Spic	Ross	Str	P	Aut	Br-L	7	Tim	Wo	78.6	T2IMV	500	168½	7625	34x7	34x7D
Indiana 220	22500	4560	Con	H	6	4⅜x4¾	427.5	45.9	100@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	50.7	L4IHV	546	170	8200	36x8	36x8D
Indiana 250	25000	5950	Con	H	6	4⅜x4¾	427.5	45.9	100@2400	C	Long	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Wo	63.7	LT41HV	664	182	10000	40x8	40x8D
Indiana 290	30000	7250	Con	L	6	4⅝x5¾	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	95.0	T4IA	676	182	10750	38x7F	40x14S
*Indiana 640	40000	9700	Con	L	6	4¾x5¾	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	90.9	T4IA	864	212	14000	38x7F	36x10S
International A W I	¾	720	Wak	L	4	3½x4½	173.0	19.6	30@2700	G	Mod	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Own	Sp	17.4	B4IM	212	136	2620	20x5.25	20x5.25
International Sp. Del.	¾	720	Wak	L	4	3½x4½	173.0	19.6	30@2700	G	Long	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Eat	Sp	60.3	BE4IM	256	124	2200	30x5.25	30x5.25
International 6 Sp. Spec.	1	820	Wak	L	4	3½x4½	173.0	19.6	30@2700	G	Long	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Eat	Sp	52.6	BE4IM	292	124	2430	30x5	30x5
International S 24	1¼	1160	Lyc	L	4	3¾x5	220.9	22.5	43@2350	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	71.3	B4IM	346	130	3200	30x5	30x5
International S 26	1¼	1310	Lyc	L	6	3¼x4½	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Ept	Sp	21.3	B4IM	346	130	3250	30x5	30x5
International A W 2	1½	675	Wak	L	4	3½x4½	173.0	19.6	30@2700	G	Long	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Own	Sp	60.3	BE4IM	492	136	2980	20x5.50	20x6.00
International S F 34	1½	1450	Lyc	L	4	3¾x5	221.0	22.5	43@2350	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	22.6	BE4IM	346	140	3520	30x5	32x6
International A L 3	1½	1450	Lyc	L	6	3¼x4½	224.0	25.3	61@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	42.9	B4IM	295	138	4300	20x6.00	20x6.00D
International S F 36	1½	1600	Lyc	L	6	3¼x4½	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	22.6	BE4IM	346	140	3570	30x5	32x6
International S D 44	2	1590	Lyc	L	4	3¾x5	221.5	22.5	43@2350	G	Long	Own	Mec	Col	Zen	Vac	AB	Own	4	Eat	Sp	40.6	BE4IM	421	117	3700	30x5	32x6
International S D 46	2	1740	Lyc	L	6	3¼x4½	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	AB	Own	4	Eat	Sp	40.6	BE4IM	421	117	3750	30x5	32x6
International S F 46	2	1950	Lyc	L	6	3¼x4½	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	4	Eat	Sp	40.6	BE4IM	421	140	4000	32x6	32x6D
International A 4	2	1985	Own	H	6	3⅝x4½	279.0	31.5	65@2600	G	Mod	Own	Mec	Ross	Zen	Vac	DR	Own	5	Own	Sp	47.8	BE4IM	378	145	5070	32x6	32x6D
International H S 54	2½	3850	Hall	H	4	4¼x5½	312.0	28.9	54@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Eat	2 R	60.5	BE4IM	726	148	8000	36x5S	36x8S
International H S 54 C	2½	3850	Hall	H	4	4¼x5½	312.0	28.9	54@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Ch	63.8	BO4IM	732	148	8065	36x5S	36x10S
International W 1	2½	3850	Hall	H	4	4¼x5½	312.0	28.9	54@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	2 R	60.5	BE4IM	710	148	8160	36x5S	36x8S
International A 5	3	2550	Own	H	6	3⅝x4½	279.0	31.5	65@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	Own	5	Own	Sp	52.6	BE4IM	430	156	5606	34x7	34x7D
International A 6	3	2675	Own	H	6	3⅝x4½	279.0	31.5	65@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	Own	5	Own	Sp	52.6	BE4IM	430	156	5750	34x7	34x7D
International H S 74	3½	4850	Hall	H	4	4⅜x5½	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Eat	2 R	70.5	BE4IM	850	160	10700	36x5S	40x12S
International H S 74 C	3½	4850	Hall	H	4	4⅜x5½	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Ch	79.1	BO4IM	736	160	11000	36x6S	40x12S
International W 3	3½	4850	Hall	H	4	4⅜x5½	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	2 R	70.5	——	—	160	10125	36x7S	40x12S
International H S 104 C	5	5500	Hall	H	4	4⅜x5½	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Ch	90.5	BO4IM	736	160	11095	36x6S	40x14S
La France Rep. A 1	6000	795	Lyc	L	6	3 x4¾	201.5	21.5	60@2500	G	G & O	Borg	Opt	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	36.1	L4IH	—	132	3000	20x5.50	32x6
La France Rep. C 1	7500	1295	Lyc	L	6	3¼x4½	224.0	25.4	61@2750	G	G & O	Borg	Spic	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	29.1	L4IH	—	144	3300	20x6.00	32x6
La France Rep. D 1	9000	1595	Lyc	L	6	3¼x4½	224.0	25.4	61@2750	G	G & O	Borg	Opt	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	37.9	L4IH	—	144	3725	30x5	30x5D
La France Rep. F 2	13000	2395	Lyc	L	6	3⅝x5	309.6	31.5	83@2800	G	Per	Ful	Spic	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	40.1	L4IHV	—	174	5520	32x6	32x6D
La France Rep. H 2	16000	2985	Lyc	L	6	3⅞x5	354.0	36.0	80@2500	G	Per	Ful	Spic	Han	Zen	Vac	Aut	Ful	4	Wis	2 R	41.6	L4IHV	—	174	6370	34x7	34x7D
La France Rep. M 2	20000	4000	Wak	L	6	4⅜x5⅛	462.0	46.0	97@2000	G	Per	Ful	Spic	Han	Zen	Vac	Aut	Ful	5	Wis	2 R	48.1	L4IHV	—	174	7500	36x8	36x8D
La France Rep. 35-2	24000	5600	Wak	L	6	4½x5¾	549.0	48.6	98@1850	G	Own	Ful	Spic	Han	Zen	Vac	Aut	Ful	4	Wis	2 R	45.4	L4IHV	—	174	9250	38x9	38x9D
Maccar 36 A	1½	1900	Bud	L	6	3⅞x4½	298.0	33.7	83@2800	G	Per	Br-L	Spic	Ross	Str	P	DR	Br-L	4	Tim	Sp	31.1	L4W	315	171	4850	32x6	32x6D
Maccar 40 A	2	2400	Bud	L	6	3⅞x4½	298.0	33.7	83@2800	G	Per	Br-L	Spic	Ross	Str	P	DR	Br-L	4	Tim	Sp	40.6	L4W	365	171	5340	32x6	32x6D
Maccar 56	3	3350	Bud	L	6	3⅞x5	311.0	33.7	72@2100	G	Per	Br-L	Spic	Ross	Str	Vac	DR	Br-L	4	Wis	2R	34.5	L4W	380	183	6200	34x7	34x7D
Maccar 60	3	3950	Bud	L	6	4⅛x5⅛	411.0	40.8	103@2100	G	Per	Br-L	Spic	Ross	Str	Vac	DR	Br-L	5	Tim	Wo	37.2	L4W	377.5	183	6600	20x9.00	20x9.00D
Maccar 66 A	4	5500	Her	L	6	4⅝x4¾	479.0	51.3	106@2100	G	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	86.7	4 A	617.5	206	8200	20x9.75	20x9.75D
Maccar 86 A	5	5950	Her	L	6	4⅝x4¾	479.0	51.3	106@2100	G	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	85.0	4 A	623	206	9500	20x10.50	20x10.50D
Mack B L	1	2500	Own	L	6	3¼x5	248.9	25.3	63@2800	G	Own	Own	Spic	Gem	Str	Vac	NE	Own	4	Own	Sp	Opt	L4IH	302	148	——	20x6.00B	20x6.00DB
††Mack B G	1½	3000	Own	L	6	3⅝x5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Sp	Opt	O4IV	415	156	——	32x6	32x6D
Mack A B	2½-3	3950	Own	L	4	4¼x5	283.7	28.9	60@2200	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	2R	Opt	O4IV	471	2-Opt	——	36x4S	36x8S
††Mack A B	2½-3	3500	Own	L	4	4¼x5	283.7	28.9	60@2200	G	Own	Own	Spic	Own	Str	Vac	RB	Own	4	Own	Ch	Opt	O4IV	471	2-Opt	——	36x4S	36x8S
Mack A B	2½-3	4750	Own	L	6	3⅝x5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	2R	Opt	O4IV	471	2-Opt	——	34x7	34x7D
††Mack A B	2½-3	4300	Own	L	6	3⅝x5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Ch	Opt	O4IV	471	2-Opt	——	34x7	34x7D
††Mack B	3-4	5250	Own	L	6	4 x5½	417.7	38.4	100@2300	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	2R	Opt	O4IV	610	2-Opt	——	36x8	36x8D
††Mack B C	3½-5	5500	Own	L	6	4 x5½	417.7	38.4	100@2300	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Ch	Opt	O4IV	610	2-Opt	——	36x8	36x8D
††Mack B J	3½-5	6150	Own	L	6	4½x5½	525.2	48.6	126@2200	G	Own	Own	Spic	Own	Str	Vac	L-N	Own	4	Own	2R	Opt	O4IV	567	3-Opt	——	36x8	36x8D
††Mack A K	3½-5	5150	Own	L	4	5 x6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	O4IV	492	3-Opt	——	36x5S	36x5DS
††Mack A K	3½-5	5250	Own	L	4	5 x6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	2R	Opt	O4IV	492	3-Opt	——	36x5S	36x5DS
††Mack A C	3½-5	4950	Own	L	4	5 x6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x5S	40x10S
††Mack A K	3½-5	6450	Own	L	6	4½x5½	525.5	48.6	126@2200	G	Own	Own	Spic	Han	Str	Vac	L-N	Own	4	Own	2R	Opt	O4IV	492	3-Opt	——	22x10.50B	22x10.50DB
††Mack A C	5½-7	5500	Own	L	4	5 x6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x6S	40x12S
††Mack A C	5½-7	6550	Own	L	6	4½x5½	525.5	48.6	126@2200	G	Own	Own	Spic	Han	Str	Vac	L-N	Own	4	Own	Ch	Opt	O4IV	492	3-Opt	——	24x10.50B	24x10.50DB
††Mack A C	7½	6000	Own	L	4	5 x6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x7S	40x14S
††Mack A P	7½	9500	Own	L	6	5 x6	706.5	60.0	150@2000	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	O2IV	287	191	——	36x7S	40x8DS
††Mack A C	10	7500	Own	L	4	5 x6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x7S	40x12S
††Mack A P	10	12000	Own	L	6	5 x6	706.5	60.0	150@2000	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	ORIV	574	3-Opt	——	36x7	40x12S
Paige	½	*895	Own	L	6	3⅛x4½	224	23.4	66@3200	C	Long	Long	Un	Ross	DL	P	DR	—	3	——	Sp	14.2	4IH	187	115	——	18x5.50B	18x5.50B
Pierce-Arrow P T	2	2950	Own	L	6	3¾x4½	298.0	33.5	70@2600	G	Long	Long	Cle	Han	Zen	P	DR	Cla	4	Tim	Sp	——	B4IMV	388	160	5600	20x7.50B	20x7.50B
Pierce-Arrow P W	3	4150	Own	L	6	4⅛x4½	361.0	40.3	77@2400	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	*Wo	——	W4IA	488	150	6800	20x9.00B	20x9.00B
Pierce-Arrow P X	4	5375	Own	L	6	4⅜x4¾	479.0	51.3	103@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	*Wo	——	W4IA	610	160	9400	20x10.50B	20x10.50B
Pierce-Arrow P Y	5	5950	Own	L	6	4⅜x4¾	479.0	51.3	103@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Own	*Wo	——	W4IA	701	160	10700	24x10.50B	24x10.50B
Pierce-Arrow P Z	8	6950	Own	L	6	4¾x5¾	611.0	54.1	130@2000	G	Long	Long	Cle	Han	Zen	P	DR	Own	4	Own	*Wo	——	W4IA	702	168	12600	36x7B	40x16B
Relay Series 15 AA	¾	1370	Con	L	6	3⅜x4	214.7	27.3	52@2200	C	Long	Borg	Blo	Han	Str	Vac	Aut	W-G	4	Own	2R	38.4	L4IH	297	131	3750	30x5P	30x5P
Relay Series 15 AB	1	1400	Con	L	6	3⅜x4	214.7	27.3	52@2200	C	Long	Borg	Blo	Han	Str	Vac	Aut	W-G	4	Own	2R	38.4	L4IH	297	131	3800	30x5P	30x5P
Relay Series S 11	1	1700	Bud	L	6	3⅜x4½	241.6	27.3	52@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Own	2R	25.5	L4IH	297	142	4050	30x5P	30x5P
Relay Series S 11	1½	1900	Bud	L	6	3⅜x4½	241.6	27.3	52@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Own	2R	30.0	L4IH	297	162	4500	30x5P	30x5DP
Relay Series 40	1½	2990	Bud	L	6	3⅝x5	309.6	31.5	56@2000	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Own	2R	34.5	L4IH	394	168	5300	34x5P	34x5DP
Relay Series 40	2	3240	Bud	L	6	3⅝x5	309.6	31.5	56@2000	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Own	2R	34.5	L4IH	394	168	5500	36x6	36x6D
Relay Series 50	2	3860	Bud	L	6	3¾x5	331.0	33.7	73@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	5	Own	2R	58.5	L4IH	584	161	6800	36x6	36x6D
Relay Series S 11	2	2030	Bud	L	6	3⅜x4½	241.6	27.3	52@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Own	2R	30.0	L4IH	297	162	4700	32x6P	32x6DP
Relay Series 40	2½	3275	Bud	L	6	3⅝x5	309.6	31.5	56@2000	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Own	2R	34.5	L4IH	394	168	5700	36x6	36x6D
Relay Series 50	2½	4000	Bud	L	6	3¾x5	331.0	33.7	73@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	5	Own	2R	58.5	L4IH	584	161	7000	36x6	38x7D
Relay Series 60	2½	4555	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	——	Zen	Vac	Aut	Ful	5	Own	2R	58.5	L4IH	584	175	7350	36x6	36x6D
Relay Series 50	3	4130	Bud	L	6	3¾x5	330.0	33.7	83@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	5	Own	2R	58.5	L4IH	584	161	7200	36x6	40x8D
Relay Series 60	3	4595	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Own	2R	58.5	L4IH	584	175	7500	36x6	38x7D
Relay Series 80	3	5170	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Borg	Blo	Ross	Zen	Vac	Aut	Cov	8	Own	2R	84.1	——	—	175	8400	36x6	40x10S
Relay Series 60	3½	4745	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Own	2R	58.5	L4IH	584	175	7800	38x7	40x8D
Relay Series 80	3½	5330	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Borg	Blo	Ross	Zen	Vac	Aut	Cov	8	Own	2R	84.1	——	—	175	8600	36x6	40x12S
Relay Series 80	4	5380	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Borg	Blo	Ross	Zen	Vac	Aut	Cov	8	Own	2R	84.1	——	—	175	8800	38x7	40x14S
*Relay Series 50 SW	5	5505	Bud	L	6	3¾x5	331.3	33.7	83@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	5	Own	2R	54.7	——	—	152	8600	36x6P	36x6DP
Relay Series 100	5	6615	Con	L	6	4⅜x4¾	428.4	45.9	100@2200	C	Long	Ful	Blo	——	Str	Vac	Aut	Ful	5	Own	2R	58.5	4IA	447	230	10000	24x9.00	24x9.00D
*Relay Series 60 SW	7	6545	Bud	L	6	4⅛x5⅛	411.0	40.8	100@2200	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Own	2R	63.6	——	—	175	12000	38x7F	40x8DP
Relay Series 100 B	7½	6900	Bud	L	6

Major Specifications and Mechanical Details of 1931 Commercial Cars

(CONTINUED FROM PAGE NINE)

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brakes	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
Stewart 30	1	695	Lyc	L	4	3¾x4½	199.0	22.5	50@2600	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Sal	Sp	35.1	B4IM	—	130	2977	20x6.50	20x6.50
Stewart 30X	1	795	Lyc	L	6	3 x4¾	185.0	19.8	55@2600	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Sal	Sp	35.1	B4IM	—	130	3018	20x6.50	20x6.50
Stewart 40	1½	895	Lyc	L	4	3¾x4½	199.0	22.5	50@2600	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Cla	Sp	35.1	B4IM	—	130	3350	20x6.50	20x6.50D
Stewart 40 X	1½	935	Lyc	L	6	3 x4½	201.5	23.8	60@2800	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Sal	Sp	35.1	B4IM	—	130	3393	20x6.50	20x6.50D
Stewart 54 X	1½	1195	Lyc	L	6	3¼x4½	224.0	25.3	61@2600	G	Own	Borg	Spic	Ross	Str	P	DR	W-G	4	Cla	Sp	35.1	B4IM	—	145	3710	20x6.50	20x6.50D
Stewart 28X	2	1495	Lyc	L	6	3¼x4½	224.0	25.3	61@2600	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	44.1	B4IM	—	136	4058	20x6.50	20x6.50D
Stewart 29 X S	2	1695	Lyc	L	6	3¾x4½	278.0	25.3	85@2750	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	44.1	B4IM	—	145	4960	32x6	32x6D
*Stewart 18 X	2½	2690	Lyc	L	6	3⅞x5	310.0	31.5	85@2750	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	4	Tim	Wo	48.1	B4IM	—	165	5230	32x6	32x6D
Stewart 32 X	2½	1990	Lyc	L	6	3¾x4½	278.0	31.5	80@2500	G	Mod	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	46.1	B4IM	—	165	5901	32x6	32x6D
Stewart 35 X	3	2590	Lyc	L	6	3¾x4½	299.0	33.8	85@2750	G	Fed	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	46.1	B4IM	—	165	5880	20x8.25B	20x8.25D
Stewart 36 X	3	2990	Lyc	L	6	3⅞x5	——	36.2	90@2750	—	—	—	—	——	Str	P	DR	Br-L	4	Tim	Wo	——	——	—	165	6500	20x8.25	20x8.25D
Stewart 38-8	3½	3990	Lyc	L	8	3¾x4¾	——	44.4	130@2800	—	—	—	—	——	Str	P	DR	Br-L	12	Tim	2R	——	——	—	170	7600	20x9.00	20x9.00D
Stewart 38-6	3½	3990	Wak	L	6	4⅜x5½	——	45.9	100@2000	—	—	—	—	——	Str	P	DR	Br-L	12	Tim	2R	——	——	—	170	7600	20x9.00	20x9.00D
Stewart 19 X	3½	3690	Lyc	L	6	3⅞x5	354.0	36.2	90@2750	G	Mod	Ful	Spic	Ross	Str	P	DR	Ful	12	Tim	Wo	105.1	B4IM	—	165	7110	34x7	34x7D
Stewart 31 X	5	4890	Wak	L	6	4⅜x5½	462.0	45.9	100@2000	G	Mod	Ful	Spic	Ross	Str	P	DR	Ful	8	Tim	Wo	82.1	B4IMV	—	165	8440	36x6S	36x6SD
Stewart 27 X	6-7	5700•	Wak	L	6	4⅜x5½	462.0	45.9	100@2000	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	8	Tim	Wo	93.8	B4IMV	—	165	9987	36x7	40x7D
Studebaker S-1	½	595	Own	L	6	3⅜x4½	221.0	27.3	——	C	McC	Long	Spic	Ross	Str	P	DR	W-G	3	Own	Sp	16.4	B4IM	148	114	2330	19x5.25	19x5.25
Studebaker S-20	1½	695	Own	L	6	3¼x4½	205.0	25.4	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	4	Tim	Sp	36.2	B4IM	224	130	2985	20x6.00	32x6
Studebaker S-30	1½	775	Own	L	6	3¼x4½	205.0	25.4	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	4	Tim	Sp	36.2	B4IM	224	160	3140	20x6.00	32x6
Studebaker S-40	2	945	Own	L	6	3¼x4½	205.0	25.4	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	4	Tim	Sp	37.4	B4IM	—	136	3775	20x6.50	20x6.50D
Studebaker S-50	2	895	Own	L	6	3¼x4½	205.0	25.4	70@3200	C	McC	Long	Cle	Ross	Str	P	DR	W-G	4	Tim	Sp	37.4	B4	276	148	3810	20x6.50	20x6.50D
Studebaker S-60	2	945	Own	L	6	3¼x4½	205.0	25.4	70@3200	C	McC	Long	Cle	Ross	Str	P	DR	W-G	4	Tim	Sp	37.4	B4IM	—	160	3850	20x6.50	20x6.50D
Studebaker GN-N	4000	1245	Own	L	6	3⅜x4½	——	27.3	70@3200	C	—	—	—	——	Str	P	DR	Cla	4	Cla	Sp	33.5	——	—	146	3265	30x5	32x6
Studebaker 88	12500	3295	Own	L	8	3½x4¾	337.0	39.2	115@3200	G	Long	Long	Spic	Ross	Str	P	DR	Ful	4	Eat	Sp	74.6	B4IMV	444	184	5200	20x7.50	20x7.50D
Studebaker 99	14000	3795	Own	L	8	3½x4¾	337.0	39.2	115@3200	G	Long	Long	Spic	Ross	Str	P	DR	Ful	4	Eat	Sp	74.6	B4IMV	505	184	5680	20x7.50	20x7.50D
White 15B	*7,500	1545	Own	L	4	3¾x5½	226.4	22.5	31@1600	G	Own	Own	Spic	Own	Zen	Vac	L-N	Own	4	Own	Sp	18.6	O2XM	226	133½	3402	30x5	30x5
White 16B	*8,000	1705	Own	L	4	4 x5¾	289.0	25.6	45@1800	G	—	Own	Mec	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4025	30x5	30x5
White 60	*8,000	1850	Own	L	6	3½x4½	269.0	29.4	54@2100	C	Own	Own	Mec	Han	Zen	Vac	DR	Own	3	Own	Sp	17.8	L4IH	276	138	3739	30x5	30x5D
White 161	*9,000	1859	Own	L	4	4 x5¾	289.0	25.6	45@1800	G	—	Own	Mec	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4290	34x7	34x7
White 162	*10,000	1900	Own	L	4	4 x5¾	289.0	25.6	45@1800	G	—	Own	Mec	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4260	30x5	30x5D
White 210	*10,000	2300	Own	L	4	4 x5¾	289.0	25.6	45@1800	G	—	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	4875	30x5	30x5D
White 61	*10,500	2450	Own	L	6	3¾x4½	299.0	33.7	61@2100	C	Own	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	4789	30x5	30x5D
White 611	*11,500	2550	Own	L	6	3¾x4½	299.0	33.7	61@2100	C	—	Own	—	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	4980	20x7.00B	20x7.00DB
White 211	*11,500	2425	Own	L	4	4 x5¾	289.0	25.6	45@1800	G	—	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	5110	32x6	32x6D
White 212	*13,000	2705	Own	L	4	4 x5¾	289.0	25.6	45@1800	G	—	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	5230	34x7	34x7D
White 56	*12,000	3125	Own	L	4	4 x5¾	289.0	25.6	45@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	Sp	26.2	O2IM	268	165	5276	36x4	36x7
White 612	*13,000	2800	Own	L	6	3¾x4½	299.0	33.7	61@2100	C	—	Own	—	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	5100	20x7.50B	20x7.50DB
White 620	*15,000	4350	Own	H	6	4 x5¼	396.0	38.4	72@1800	G	Own	Own	Spic	Own	Zen	P	DR	Own	4	Own	Sp	41.8	OL4IHV	—	157	7300	20x8.25B	20x8.25DB
White 51A	*17,000	3759	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	Sp	35.6	O2IM	335	170	6438	36x5	36x8
White 51AT	*17,000	3875	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	Sp	46.6	O2IM	335	134	6227	36x5	36x8
White 621	*18,000	4650	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	OL4IHV	—	157	7700	20x9.00B	20x9.00DB
White 610	*20,000	6100	Own	H	6	4⅜x5¾	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	Sp	33.9	O4IA	—	180	9200	20x9.00B	20x9.00DB
White 630	*20,000	5000	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	—	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	O4IHV	554	168	8500	20x9.00B	20x9.00DB
White 55	*21,500	4650	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	66.1	OPXM	224	174	8737	36x5	40x5D
White 58	*22,000	4490	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	49.7	OPXM	224	180	7797	36x5	36x5D
White 641	*24,000	6450	Own	H	6	4⅜x5¾	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	46.9	O4IA	—	180	9700	20x9.25B	20x9.25DB
*White 630 SW200	*24,000	6289	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	—	Own	Spic	Ross	Zen	P	DR	Own	4	TIM	WO	44.2	OTIHV	—	193	10000	20x8.25B	20x8.25DB
White 631	*24,000	5750	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	2R	56.9	O4IHV	—	168	9000	20x9.25B	20x9.25DB
White 52	*26,000	5100	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	58.4	OPXM	224	174	9409	36x6	40x12
White 52T	*28,000	4700	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	76.5	OPXM	224	129½	8461	36x5	40x5D
White 613	*32,000	6950	Own	H	6	4⅜x5¾	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	66.5	O4IA	—	180	10900	24x10.50B	24x10.50DB
*White 612 SW310	*34,000	8045	Own	H	6	4⅜x5¾	519.0	45.9	96@1800	C	—	Own	Spic	Ross	Zen	P	L-N	Own	4	TIM	WO	55.6	OTIHV	—	198	12670	20x9.00B	20x9.00DB
White 642	*34,000	6750	Own	H	6	4⅜x5¾	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	66.5	O4IA	—	180	10600	24x9.75B	24x9.75DB
*White 613 SW410	*40,000	8570	Own	H	6	4⅜x5¾	519.0	45.9	96@1800	C	—	Own	Spic	Ross	Zen	P	L-N	Own	4	TIM	WO	69.9	OTIHV	—	198	14400	40x8	40x8D
**White 60K	——	2200	Own	L	6	3½x4½	260.0	29.4	54@2100	C	—	Own	MEC	Han	Zen	Vac	DR	Own	3	Own	Sp	17.5	L4IH	276	112	5200	20x7.00B	20x7.00B
White 601	——	1900	Own	L	6	3½x4½	260.0	29.4	54@2100	C	—	Own	MEC	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	3825	20x7.00B	20x7.00B
White 602	——	2050	Own	L	6	3½x4½	260.0	29.4	50@1800	C	—	Own	MEC	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4125	20x7.50B	20x7.50B
Willys 6-C-113	½	395	Own	L	6	3¼x3⅞	193.0	25.3	65@3400	C	Fed	Borg	Spic	Own	Til	P	Aut	Own	3	Own	Sp	13.2	B4IM	147	113	1872	19x5.00	19x5.00
Willys 6-C-131	1½	595	Own	L	6	3¼x3⅞	193.0	25.3	65@3400	C	Fed	Borg	Spic	Own	Til	P	Aut	W-G	4	Cla	Sp	40.8	B4IM	232	131	2625	20x5.50	32x6

GENERAL NOTATIONS

****REFERENCE MARKS** apply to individual lines only and explanations are given under the subdivision for each company in the "SPECIAL NOTATIONS."

CAPACITIES given in this table are in tons or fractions of tons. *Shows maximum allowable gross weight in pounds.

WHEEL BASES given are standard, but optional wheel bases are available in many cases.

ENGINE—Bud, Buda; Con, Continental; Her, Hercules; Lyc, Lycoming; Pont, Pontiac; Wak, Waukesha; Wis, Wisconsin; Hall, American Car & Foundry.

VALVE ARRANGEMENT—L, "L" head, H, in head; O, overhead; T, T head.

TYPE OF CAMSHAFT DRIVE—G, gear; C, chain.

RADIATOR MAKE—G & O, G & O Mfg. Co.; Per, Perfex Corp.; Long, Long Mfg. Co.; Har, Harrison Radiator Corp.; Fed, Fedders Mfg. Co.; McC, McCord Radiator & Mfg. Co.; Mod, Modine Mfg. Co.

CLUTCH MAKE—Jon, Jones Clutch & Gear Co.; Ful, Fuller & Sons Mfg. Co.; Borg, Borg & Beck Co.; Br-L, Brown Lipe Gear Co.; Rock, Rockford Drill & Machine Co.; Cov, Covert Gear Co.; Long, Long Mfg. Co.; Detr, Detroit Gear & Machine Co.; Mer, Merchant & Evans; Hel, Merchants & Evans.

UNIVERSALS MAKE—Spic, Spicer Mfg. Co.; Bio, Blood Bros. Machine Co.; Sup, Superior Universal Products; Un, Universal Products Co.; Cle, Cleveland Steel Products Corp.; Pet, Peters; Opt, optional; Mec, Mechanics Machine Co.

STEERING GEAR MAKE—Ross, Ross Gear & Tool Co.; Han, Hannum Mfg. Co.; Sag, Saginaw Steering Gear Co.; Gem, Gemmer Mfg. Co.; Col, Columbus Gear & Pump Co.; W-G, Warner Gear Corp.

CARBURETOR—Car, Carter; Mar, Marvel; Sch, Wheeler-Schebler; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; Zen, Zenith-Detroit.

FUEL FEED—Gra, gravity; Vac, vacuum tank; P, fuel pump.

ELECTRICAL SYSTEM—AB, American-Bosch; Aut, Electric Auto-Lite; Eis, Eisemann; L-N, Leece-Neville; NE, North East.; RB, Robert Bosch; DR, Delco-Remy.

TRANSMISSION—Br-L, Brown-Lipe; Cov, Covert; Ful, Fuller; Mec, Mechanics Machine; Mun, Muncie; W-G, Warner Gear; Cot, Cotta Gear Co.; Cla, Clark Equipment Co.

REAR AXLE—Cla, Clark Equipment; Col, Columbia; Eat, Eaton; Pont, Pontiac; Sal, Salisbury; Tim, Timken; Wis, Wisconsin.

FINAL DRIVE—IG, internal gear; St, straight bevel; Sp, spiral bevel; Wo, worm; 2R, double reduction; Ch, chain; S-T, semi-transverse.

TIRES—B, balloon; D, dual; S, solid; P, pneumatic.

TYPE OF SERVICE BRAKES—B4IM, Bendix, 4 wheel, internal, mechanical; B6IA, Bendix, 6 wheel, internal, air; B4IMV, Bendix, 4 wheel, internal, mechanical, vacuum; BrIA, Bendix operating on 4 rear wheel, internal, air; BW4IM, Bendix front, Wisconsin rear, 4 wheel, internal, mechanical; BE4IM, Bendix front, Eaton rear, 4 wheel, internal, mechanical; BO4IM, Bendix front, own rear, 4 wheel, internal, mechanical; B4IH, Bendix, 4 wheel, internal, hydraulic; B4, Bendix, 4 wheel; C4IM, Columbia, 4 wheel, internal, mechanical; K2IM, Clark, 2 wheel, internal, mechanical; L04ID, Lockheed, own, 4 wheel, internal, drive shaft; LT4DV, Lockheed, Timken, 4 wheel, drive shaft, vacuum; L4IH, Lockheed, 4 wheel, internal, hydraulic; L4IHV, Lockheed, 4 wheel, internal, hydraulic, vacuum; LT4IVA, Lockheed, Timkens, 4 wheel, internal, vacuum, air; L6IHV, Lockheed, 6 wheel, internal, hydraulic vacuum; L6IH, Lockheed, 6 wheel, internal, hydraulic; O2IM, Own, 2 wheel, internal, mechanical; O2IV, Own, 2 wheel, internal, vacuum; O4IA, Own, 4 wheel, internal, air; O4IM, Own, 4 wheel, internal, mechanical; O4IV, Own 4 wheel, internal, vacuum; O4M, Own, 4 wheel, mechanical; O2XM, Own, 2 wheel, external, mechanical; O4XM, Own, 4 wheel, external, mechanical; OJXM, Own, jack shaft, external, mechanical; OL4IH, Own, Lockheed, 4 wheel, internal, hydraulic; OPX, Own, propeller shaft, external; OPXM, Own, propeller shaft, external, mechanical; OPM, Own, propeller shaft, mechanical; ORIV, Own, rear wheels, internal, vacuum; S4IM, steeldraulic, 4 wheel, internal, mechanical; TrIA, Timken operating on 4 rear wheel, internal, air; T4IA, Timken, 4 wheel, internal, air; T6IA, Timken, 6 wheel internal, air; T2IMV, Timken, 2 wheel, internal mechanical, vacuum; W4I, Westinghouse, 4 wheel, internal; W4IA, Westinghouse, 4 wheel, internal, air; 4IA, 4 wheel, internal, air; 4IH, 4 wheel, internal, hydraulic.

SPECIAL NOTATIONS

AMERICAN-LA FRANCE

*Chief model also available as 2½-ton model, 34x7 tire, dual rear, weight 6,400. Price $7,900.

Chieftain model also available as Dump Truck, 160-inch wheel base.

Balloon tires optional on Chief, Chieftain and Big Chief models.

AUTOCAR

*Engines in these models are located under the driver's seat.

BROCKWAY

*Six wheelers.

CHEVROLET

Utility model available on 131-inch wheel base with chassis weight of 2,760 pounds and equipped with dual rear wheels.

DAY ELDER

*Six wheeler.

Additional standard wheel bases are available on different models as follows:—

60.....	156,	206.....	165, 180, 204
85.....	156, 168	240.....	214
118	168, 186	285.....	216
130	165, 180, 204	345.....	216
160.....	165, 180, 204	402.....	216

DODGE

*Models F40, F41, F61 and F62 can be had with double drop frame.

DIAMOND T

*Six wheelers.

Additional standard wheel bases available as follows:—

551.....	158	750.....	167, 192
504	168½	801.....	180½, 199¼
506.....	174	1200.....	174½, 180
602.....	157, 179	1600.....	174½, 190
606.....	177½	1601.....	181

F. W. D.

*Indicates six-wheel model.

The BTL and BT models are special line construction trucks in which complete provision for mounting AT and T earth boring machine, winch, body and other line construction accessories is included in the standard chassis.

Special power take-off transmission, which provides 3 power take-offs which may be operated in any transmission speed, optional on all models.

FEDERAL

*Six wheelers.

GRAMM

Series	Straight Rating	Wheel Base	Pay Load Range
AX 4	8,000	157	1 ton
AX 6	8,000	157	1 ton
BX 4	10,000	157	1½ ton
BX 6	10,000	157	1½ ton
CX 4	12,000	157-180	2 ton
CX 6	12,000	157-180	2 ton
B	12,000	157-174	1¾ ton
C	14,000	145-196	2 ton
D	17,000	145-196	2½ ton
E	20,000	145-196	3 ton
GW	20,000	157-240	4 ton

†Both the four and six cylinder are also offered in 157-inch wheel base at $1,145 and $1,345, respectively.

GENERAL MOTORS TRUCK

*Capacity indicated is the Straight Rating (combined weight of chassis, body, equipment and payload) for which each chassis is designed and guaranteed to satisfactorily operate under average conditions. The size of the tires used does not affect this Straight Rating, but to secure maximum tire mileage it is suggested that the total gross weight be limited to a "recommended gross weight" for each tire equipment based on tire capacity. Prices cover base chassis and vary with wheel base and tire combinations. The number of wheel base lengths, tire types, range of "recommended gross weights" and resulting payload range (assuming nominal body allowance) for each model follows:—

Note: Models T-15 to T-60, inclusive, are available for export only as coach chassis.

Model	Wheel Bases	Tire Types	Range of "Rec. Gross Weights"	Payload Range
T-11	1	1	3800	½
T-15	3	10	4500- 6500	½-1½
T-17	2	8	5500- 6500	1-1½
T-19	3	22	6500- 8500	1½-2
T-25	3	17	6800- 9000	1½-2
T-26	4	..	8500-11000	2-3
T-30	3	15	10000-12500	2-3
T-42	4	12	12000-15000	2½-4
T-44	4	12	12000-16000	3-4½
T-51	4	..	16500-19000	4-5½
T-55	4	..	16500-19000	4-5½
T-60	4	18	18500-22000	5-6½
T-61	4	..	19500-22000	5-6½
T-82	4	12	19000-24000	5-7
T-85	3	..	22000-26000	5-7
T-90	3	7	22000-28000	5-7½
T-95	3	..	28000-34000	7-9
T-96	3	..	28000-34000	7-9

†Models T-90, T-95 and T-96 are six wheelers, the latter having one driven and one trailing axle. Optional rear axle gear ratios available for all models. Double reduction axles available for Models T-60, T-61 and T-82.

INDIANA

*Six wheelers.

MACK

Other wheel bases furnishes on all truck models.

On 6-wheel jobs, 4 rear wheels driven by chains, foot brake on 4 rear wheels.

††Made also in tractor models.

PAIGE

*Price includes panel or screen body.

PIERCE-ARROW

*Optional final drive on Models PW, PY and PZ.

REO

Model 15 Junior can be had with 4-speed transmission at additional cost. Models 15 Junior, DF 129, DF, FA, FE and FF are available with dual wheels at additional cost.

SELDEN

Additional standard wheel bases are available on different models as follows:—

Model 37C.....	162 and 181
39C.....	177 and 190½
47CB, 47CD ..	151, 164 and 184
67C.....	151, 164, 184 and 198

STEWART

Models 39 and 39X can also be supplied in 110, 120 and 140-inch wheel base.

Models 40 and 40X can also be supplied in 110, 140 and 160-inch wheel base.

*Model 34X can be supplied in 135, 145, 160 and 176-inch wheel base.

Model 28X can be supplied in 130, 145, 160 and 176-inch wheel base.

Model 29XS can be supplied in 135, 160 and 176-inch wheel base.

*Models 18X, 32X and 36X can be supplied in 148, 190 and 220-inch wheel base.

*Models 19X, 31X and 27X can be supplied in 148, 172, 190, 220 and 235-inch wheel base.

As optional equipment models 18X, 19X, 36X, 31X and 27X can be supplied with Timken dual reduction rear axle.

Models 38-8 and 38-6 can be supplied in 196, 226 and 241-inch wheel base and worm axle.

STUDEBAKER

*Capacity model GN-N is 4,000 pounds for body, cab, driver and payload.

Maximum gross load, chassis, body and payload for Models 77 and 88 is 12,500 lbs. and for Model 99 is 14,000 lbs.

‡Hand brake same as foot brake, standard. Hand brake on drive shaft, special equipment.

WHITE

*Six wheelers.

**Price on Model 60K includes body.

Auburn Sales in March 170% Above Last Year

New York, April 16.—Continuing the fast pace set since the first of the year, retail sales of new Auburn passenger cars in March showed not only a gain over February, but over a year ago, according to registration returns from eighteen states and the District of Columbia.

Auburn registrations in these states last month amounted to 975, as against 360 in the corresponding month of last year, a gain of 170 per cent., and comparing with 643 in the preceding month, an upturn of 51 per cent.

For the first three months of the year Auburn sales in these states aggregated 2,166, as compared with 797 in the same states in the first quarter of 1930, an increase of 171 per cent.

In thirteen of the eighteen states and in the District of Columbia Auburn sales in March of this year were higher than a year ago, while gains were set up for the first three months in twelve states and District of Columbia.

The states in which Auburn was more heavily registered in March of this year than last were: Connecticut, 71 to 29; Florida, 25 to 6; Illinois, 337 to 152; Maryland, 39 to 11; Minnesota, 69 to 8; Montana, 7 to 4; North Carolina, 13 to 0; North Dakota, 2 to 1; Ohio, 249 to 81; South Carolina, 1 to 0; Virginia, 10 to 2; West Virginia, 15 to 4; Wisconsin, 78 to 26, and District of Columbia, 43 to 11.

The states in which Auburn sales in the first three months topped a year ago were Connecticut, Florida, Illinois, Maryland, Minnesota, Montana, North Carolina, Ohio, South Carolina, Virginia, West Virginia, Wisconsin and the District of Columbia.

Following are the registrations of new Auburn cars in the eighteen states and the District of Columbia for March, as compared with the corresponding month of last year and February of this year:

	Mch., 1931	Mch., 1930	Feb., 1931
Alabama	..	1	..
Arkansas	..	3	..
Connecticut	71	29	27
Delaware	7	9	1
Florida	25	6	9
Illinois	337	152	332
Maryland	39	11	23
Minnesota	69	8	3
Montana	7	4	2
North Carolina....	13	..	7
North Dakota.....	2	1	..
Ohio	249	81	154
South Carolina....	1	..	..
South Dakota.....	..	2	..
Utah	9	10	1
Virginia	10	2	9
West Virginia.....	15	4	8
Wisconsin	78	26	41
Dist. of Columbia.	43	11	26
Totals.....	975	360	643

Following are the registrations of new Auburn cars in the eighteen states and the District of Columbia for the first quarter, as compared with the corresponding period of last year:

	1931	1930
Alabama	..	2
Arkansas	..	4
Connecticut	102	50
Delaware	9	13
Florida	44	34
Illinois	945	303
Maryland	66	23
Minnesota	76	16
Montana	14	10
North Carolina.....	20	4
North Dakota.....	2	2
Ohio	552	192
South Carolina.....	2	..
South Dakota.....	..	7
Utah	10	19
Virginia	21	11
West Virginia.....	26	14
Wisconsin	206	73
District of Columbia....	71	30
Totals.....2,166		797

WEEKLY BUSINESS INDICATORS

SURVEY OF CURRENT BUSINESS

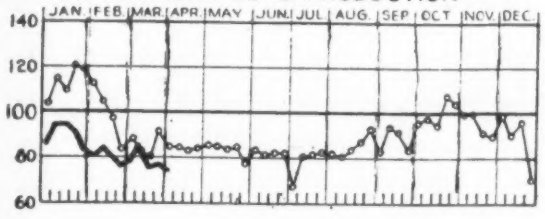
UNITED STATES DEPARTMENT OF COMMERCE

DATA PLOTTED, WHERE AVAILABLE FOR WEEK ENDING APRIL 11, 1931

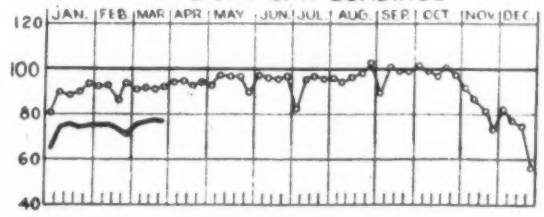
WEEKLY AVERAGE, 1923-1925, INCLUSIVE=100

LEGEND
1930
1931

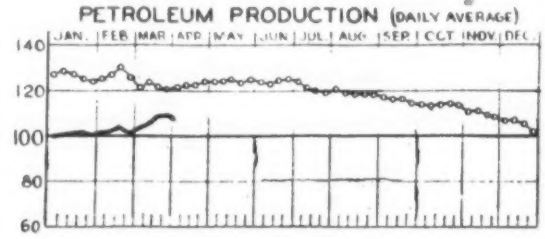
BITUMINOUS COAL PRODUCTION



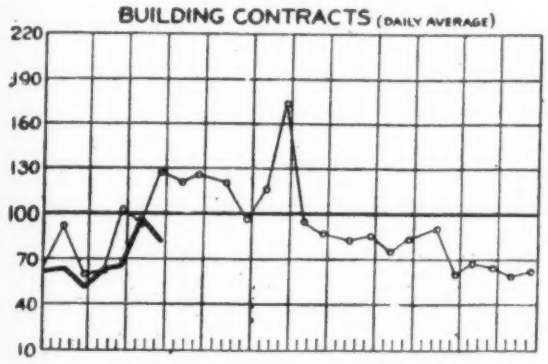
FREIGHT CAR LOADINGS



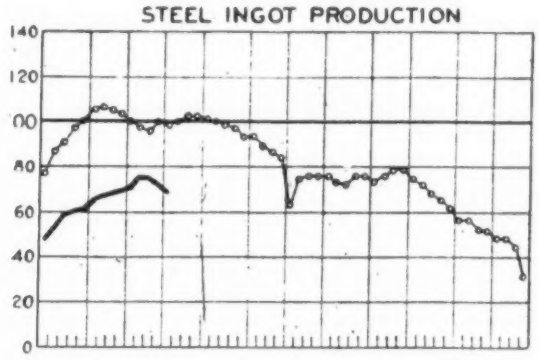
PETROLEUM PRODUCTION (DAILY AVERAGE)



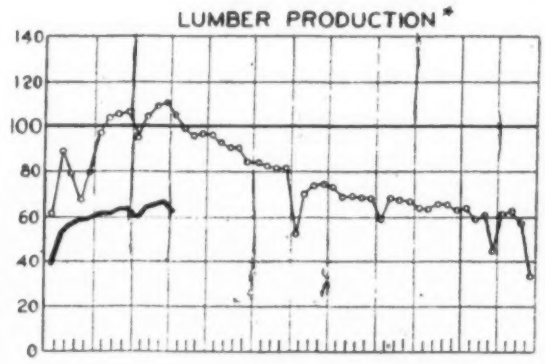
BUILDING CONTRACTS (DAILY AVERAGE)



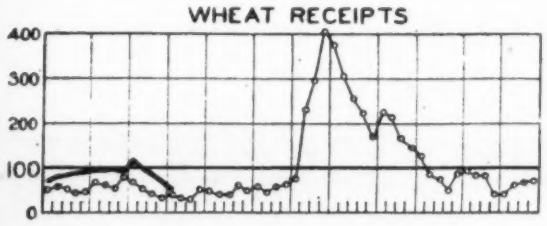
STEEL INGOT PRODUCTION



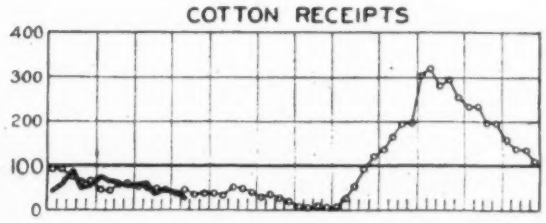
LUMBER PRODUCTION *



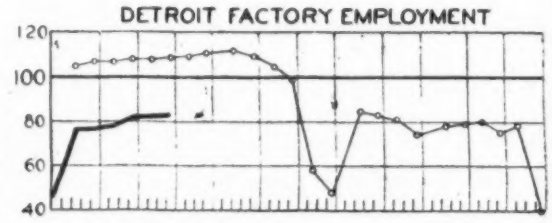
WHEAT RECEIPTS



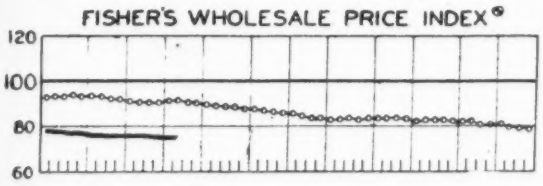
COTTON RECEIPTS



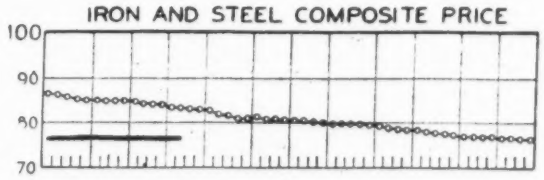
DETROIT FACTORY EMPLOYMENT



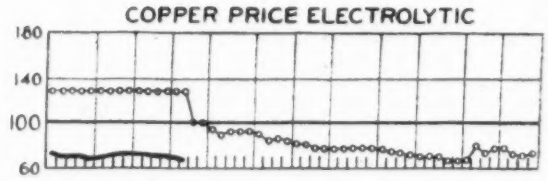
FISHER'S WHOLESALE PRICE INDEX ●



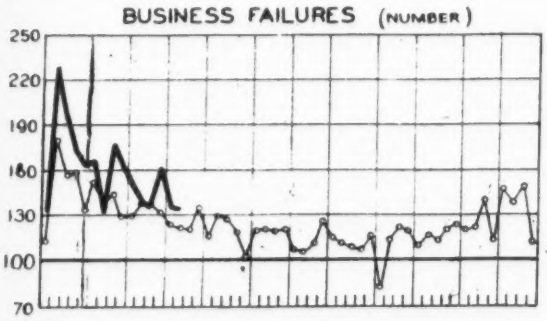
IRON AND STEEL COMPOSITE PRICE



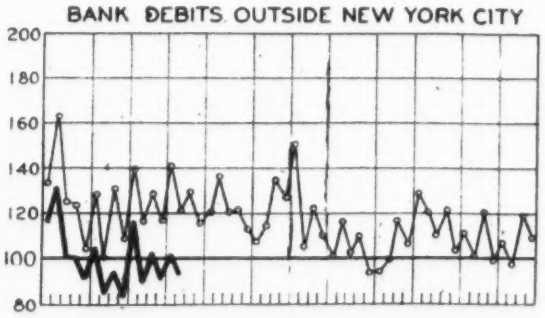
COPPER PRICE ELECTROLYTIC



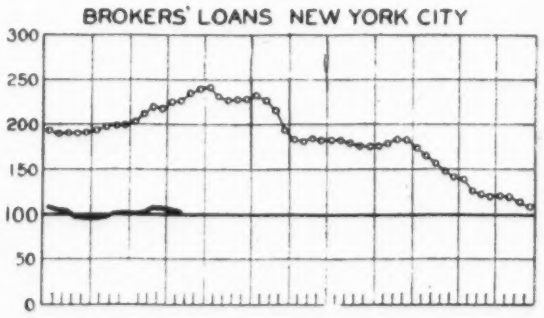
BUSINESS FAILURES (NUMBER)



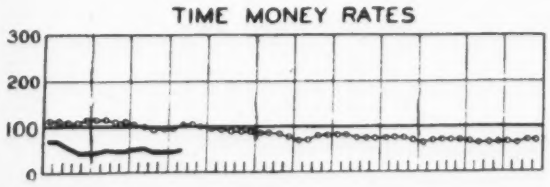
BANK DEBITS OUTSIDE NEW YORK CITY



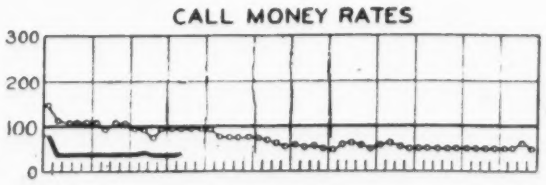
BROKERS' LOANS NEW YORK CITY



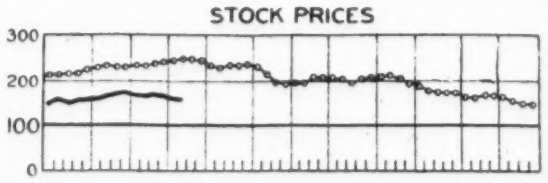
TIME MONEY RATES



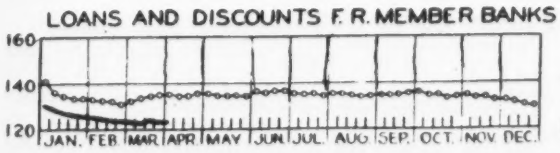
CALL MONEY RATES



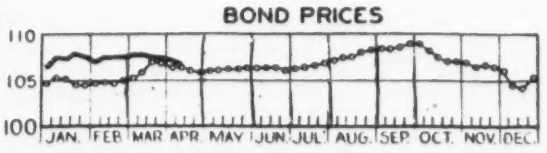
STOCK PRICES



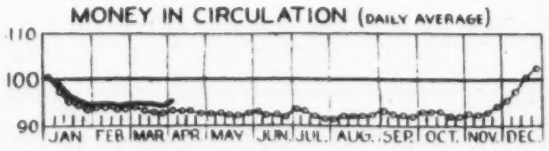
LOANS AND DISCOUNTS F. R. MEMBER BANKS



BOND PRICES



MONEY IN CIRCULATION (DAILY AVERAGE)



* RELATION TO WEEKLY AVERAGES 1928-1930 PER WEEK SHOWN. ● RELATIVE TO 1926=100

ERIE METER SYSTEMS REPORT OUTPUT GAINS

Erie, Pa., April 16.—Expansion of gasoline filling station facilities and erection of new units in various sections of the country this spring have reflected favorably on operations at the plant of the Erie Meter Systems, Inc., in Wesleyville, a suburb. Output during the past year has been on a 100 per cent. capacity basis and officials report enough new business at hand to warrant maintenance of current full production schedules well into the last quarter of the year. The company manufactures gasoline and oil-measuring devices used extensively in filling stations.

LEASES ACCESSORY STORE

North Bergen, N. J., April 16.—The Tide Water Oil Sales Corporation has leased the accessory store at 927 Bergenline Ave. from Benjamin C. Raab for one year at a rental of 1 cent per gallon. The lease carries the privilege to purchase the four-story brick flat with the store at the address for $50,000.

ADDS WILLYS LINE

Oswego, N. Y., April 16.—R. E. Davis & Son, West 1st and Cayuga Streets, Oswego, Marmon, Pierce-Arrow, Studebaker, Oakland-Pontiac dealer for Oswego and vicinity, has added the Willys and Willys-Knight lines of cars and trucks.

Aviation Spark Plugs

(Continued from Page 7)

not injured in the process of assembling. However, a plug must be reasonably gas tight, and to make it so without injuring the mica cigarette is a very difficult problem, many different solutions of which have been tried.

Expansion of a soft metal tube inside the mica cigarette, compressing the cigarette in a cell of powdered mica formed in the bushing nut of the plug, bulldozing a brass bushing out about the cigarette, are methods being used by various manufacturers at the present time. The methods used in B. G. plugs, that of forcing a soft metal cone, through which the cigarette and spindle pass, into a taper seat in the bushing nut, seems to be as satisfactory as any.

The built up mica core or insulator is assembled with shellac or other binder under heavy pressure and is held together by upsetting the terminal end of the spindle. After proper baking the core is formed by ordinary machining operations. The center spindle of B. G. Hornet spark plugs is built up of three special materials electrically welded together, each material serving a particular purpose. The machined cores are assembled in shells or bodies, which have the shell electrode either inserted in a drilled hole or crimped in or made integral with the shell.

There seem to be no fixed rules for design among manufacturers of mica plugs, as those produced by various firms differ widely in appearance and proportions. The particular design, in many cases, limits the satisfactory operation of the spark plug to a very narrow range of engine operating conditions. Manufacturers, to meet the various ranges of engine conditions, generally vary the amount of mica core exposed to the cylinder gases, much the same as is done in automobile plugs, producing what are generally referred to as "hot" or "cold" plugs. In this country a plug with a long core exposure is referred to as a hot plug, one with a short core exposure, a cold plug. The designer, as is usual in most engineering lines, has two extremes of conditions to meet. High compression highly supercharged engines tend to burn up any sort of plug inserted in their cylinders, particularly when the fuel distribution, or cooling of the engine cylinders are not what they should be. Engines which tend to pump oil or have improper carburetor settings giving a rich mixture, tend to foul plugs, particularly when idled for long periods in cold weather. The resistance of a plug to fouling depends on two things, the length of the flash-over path of that portion of the mica exposed to the cylinder gases, and the temperature at which that mica is maintained. If a plug is designed with too much mica exposure it will have good resistance to fouling, but at full throttle the mica and spindle head will become over-heated, preignition will set in, the power output of the engine will fall off, and the plug, piston or cylinder will start to burn up. Preignition due to faulty spark plugs is very dangerous and can result in complete engine failure without leaving any clue in the appearance of the plugs as to what caused the failure.

The introduction of copper spindles, copper tubes about the spindle, cooling fins on the terminal or shortening the core exposure will eliminate the tendency to preignite, but it does not follow that all such changes will make a better spark plug, as they may cut down the resistance to fouling sufficiently to make the plug impractical for general use. It is easy to make a plug to cover a narrow range, but to make a plug which is satisfactory for general use in standard engines, which will also stand up under full throttle dynamometer operation of supercharged engines, is a different problem.

If, in the design of a spark plug, resistance to fouling and preignition sufficient to give a wide range of operation has been obtained, electrode life becomes the most important consideration, as it determines the total life of the plug and the servicing expense involved in keeping the plug in operation. Nickel manganese alloys seem to be the best electrode materials produced to date. In the latest model of B. G. Hornet plugs four heavy shell electrodes made integral with the shell are used to obtain as long electrode life as possible with the least possible labor resetting the gaps. In commercial operation these plugs have been in use 150 to 200 hours without resetting the gaps. Three types of these plugs, the 3B-1, 4B-1 and 5B-1, seem to cover the whole range of present-day engine operation in a very satisfactory manner.

In the operation of aircraft, the conditions are much different than in the operation of other automotive equipment using spark plugs. Engine speed seldom exceeds 2,500 revolutions per minute and due to propeller loading, the engine is not required to develop much power at low speeds, and as a rule is not idled for any length of time or at very low speeds. The spark gaps can be set at .012 to .015 inch without materially affecting the operation of the engine at idling speeds. The standard gap for new military and commercial aircraft spark plugs is .015 inch. It is not safe to permit the gaps to become greater than .031 to .032 inch, although on dynamometer tests plugs with gaps of .040 inch seem to hold full throttle load without any trouble. Most commercial operators do not permit the gaps to become greater than .025 inch. The danger with large gaps lies in the loss of power at full throttle which they may cause, since the resistance of the gap increases with the density of the cylinder charge. They are most likely to cause trouble in taking off just when full engine power should be available. A plug will also foul more easily with an excessive gap.

As a rule, fouling does not occur in all cylinders at once. A plug which is dry and in which the electrodes are whitish gray at the gap is doing its work properly. A fouled plug is easy to distinguish by the general appearance of the core and electrodes. Plugs are too often blamed for trouble which is due to general engine conditions or to other accessories which are at fault.

As a rule, if engine conditions are right, modern plugs, if properly chosen for the engine, give little trouble. If a careful job of cleaning and reconditioning plugs is done, reconditioned plugs will pass all the factory tests given new plugs and are as reliable as new plugs. One of the large commercial operators has gradually improved their methods of servicing the plugs, and trained their personnel to a point where they are now obtaining 350 hours out of the plugs. Reports have been made by some of the largest operators of 600 to 900 hours on a set of plugs.

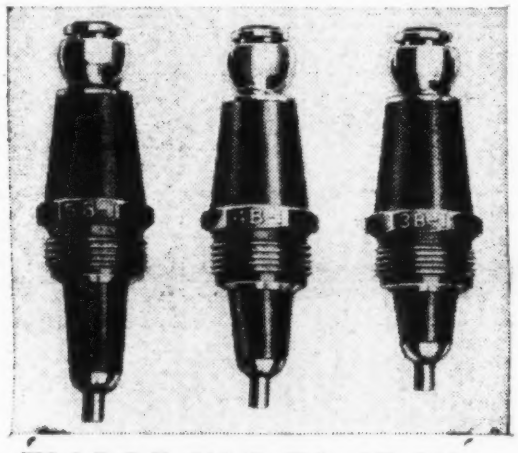


FIG. 2. B. G. No. 3B-1, No. 4B-1 and No. 5B-1 cores

RUBBER INDUSTRY STAGES RECOVERY FROM LOW LEVELS

New York, April 16.—Developments in the rubber industry so far in the current year have been marked by a seasonal recovery in manufacturing operations from the low levels of last fall, and by a continuation of the unfavorable factors which have depressed the crude rubber market during the past two years.

During the first two months of 1931, the output of the industry was about 30 per cent. under the average rate for the corresponding periods of the four preceding years, and about 15 per cent. below that for the first two months of 1930. While figures are not available for March, the report on rubber consumption for the month indicates that operations probably made a more favorable comparison with those of preceding years. Consumption showed a decline last month of only 8 per cent. from March, 1930, compared with a decrease of 17 per cent. in the first two months of the year.

By the end of February, the production of casings had increased approximately 50 per cent. from the low point reached in November of last year. The output in February was approximately 3,985,000 casings, a decrease of 12.5 per cent. from that of February, 1930, and of 30 per cent. from the average February output maintained in the preceding four years. Tire shipments in February showed the usual seasonal decline, decreasing 9.2 per cent. from January. The volume of shipments was 18.9 per cent. below that of February, 1930, and about 26 per cent. under the four-year average for the month.

Inventories of pneumatic casings as of February 28 totaled approximately 9,536,000 units compared with 12,411,000 at the corresponding date in 1930, a decrease of 23.2 per cent., and with 14,526,000 on February 28, 1929, a decline of 34.3 per cent. On the basis of current reduced sales requirements, however, stocks of tires were at approximately the same levels as in the two preceding years, representing about 2.8 months' supply.

Operations in lines other than tire manufacturing have been irregular, but generally have shown a more favorable comparison with business in preceding years. Sales in the rubber footwear field have been curtailed by the unusually mild winter weather and by large stocks of finished goods on hand. Activity in the rubber mechanical goods field has proceeded at a more satisfactory rate, although fluctuating with the various industries requiring those products.

Prior to the summer buying season, which marks the peak months for tire sales, it is difficult to gauge the current year's market for tires or the extent to which delayed buying over the past year will exert an upward influence on demand. Until the extent of the potential summer buying can be forecast more accurately, it is likely that manufacturers will continue to restrict production and watch consumer demand closely. Deliveries for original equipment have continued at low but expanding levels in line with the trend of automobile production.

The consensus of the trade is that the present retail tire prices, which have been effective since early in January, will be maintained for an indefinite period, although developments within the next few months may alter that status. The chief endeavor of the trade has been to improve conditions in various lines of tire business, which, due chiefly to competitive reasons, have been conducted on an unprofitable price basis. Some progress has been achieved in that direction.

Unfavorable developments have continued to dominate the crude rubber situation. While some reduction in shipments has been effected, the curtailment has not been sufficient to equalize the decline in consumption, with the result that stocks on hand on the estates, at London and Liverpool, and in the United States, have continued a steady increase.

Shipments of crude rubber from the Malay estates during the first quarter totaled 132,119 tons, against 148,212 tons in the first quarter of 1930, a decline of 16,093, or 10.8 per cent., while total stocks of crude rubber in the Far East amounted to 44,317 tons at the end of March, compared with 39,500 tons on March 31, 1930, an increase of 12 per cent.

Stocks of crude rubber at London and Liverpool have continued the steady accumulation which has been in process since late in 1928. On April 11 these stocks totaled 134,154 tons, an increase of 14,596 tons, or 12 per cent., since the first of the year, and of 40,699 tons, or 43 per cent., since the corresponding period in 1930. The rise in stocks at those points has been continuouus since the last low of 19,988 tons on November 30, 1928.

Stocks on hand in the United States have advanced to new high levels, totaling 217,804 tons on March 31, an increase of 7 per cent. from the first of the year, and of 53.6 per cent. from March 31, 1930. Consumption of crude rubber in the United States during the first quarter totaled 90,142 tons, compared with 105,309 tons in the corresponding quarter of 1930, a decline of 14 per cent., while imports amounted to 114,081 tons, against 136,622 tons last year, a decrease of 16 per cent.

Under the stimulus of steadily mounting stocks on hand, the price of crude rubber has declined irregularly so far this year with the current quotation of around 6.75 cents a pound for the near month comparing with 8.45 cents at the beginning of the year, a decrease of about 20 per cent. Efforts to conclude an agreement on restriction of output among producing nations have so far been unsuccessful.

While the present trend in crude rubber, if maintained, may entail further inventory losses by rubber manufacturers this year, the actual decrease in the value of inventories cannot approach that of 1930, when the price of crude rubber declined from about 16 cents to 8 cents a pound.

LIBBEY-OWENS-FORD IN TRIPLEX DEAL, SAYS N. Y. REPORT

(Continued from Page 1)

to supply safety glass for its cars and it is reported that Henry Ford is responsible for the negotiations that have led to the possible arrangement between Libbey-Owens-Ford and Triplex. There is no connection between the Ford interests in the glass company and the Ford Motor Company.

It is expected that the details of the arrangement will be announced soon.

GABRIEL REPORTS PROFIT OF $8,201 IN QUARTER

Cleveland, April 16.—Gabriel Company reports for quarter ended March 31, 1931, net profit of $8,201 after interest, depreciation and taxes, equivalent to 4 cents a share on 200,000 no-par shares of combined Class A and Class B stocks, compared with net profit of $5,820, or 2 cents a share, on combined stocks in preceding quarter, and net loss of $56,789 in first quarter of 1930.

REPORT LOCOMOBILE PLANT TO BE SOLD JUNE 3

Bridgeport, Conn., April 16.—The local plant of the Locomobile Company of America will be sold June 3, "unless the property is redeemed," under an order issued Monday by Judge Newell Jennings of the Superior Court.

NEW PACKARD DEALER

Trenton, N. J., April 16.—The Motor Sales and Service Company has been appointed Packard dealer and will be located at Packard's old address, Brunswick and Evans Avenues. Arthur Stryker is president of the new concern, with J. E. Alderman vice-president and general manager and Howard Gibbs service manager.

1ST A. P. I. MID-YEAR MEETING OPENS AT ST. LOUIS

(Continued from Page 6)

problem at the bureau under the auspices of the Co-operative Fuel Research Steering Committee, he declared, had led to the conclusion that gasoline manufacturers can help by minimizing the propane content of the fuel and automobile builders by relocating or redesigning fuel feed systems. Mr. Bridgeman advocated equipping motor vehicles with fooler fuel feed systems, pointing out that fuel temperatures can be lowered many degrees by such simple changes as placing feed lines outside the frame channel, using thermal insulation, reducing heat conduction from engine to fuel pump and cooling the pump in the air stream.

Study of temperature in the fuel feed lines of twenty-seven cars, Mr. Bridgeman said, indicated that the ideal line was one in which fuel temperature does not rise above that of the atmosphere. The tests indicated that in present cars, operating at speed over level and hilly routes, or with the motor idling, the temperature of gasoline in the tank averages 20 degrees above that of the atmosphere, is heated an additional 11 to 23 degrees in flowing to the fuel pump or vacuum tank inlet and rises 12 to 16 degrees more in passing through the pump of vacuum tank.

Reducing gasoline vapor pressure to a low value, Mr. Bridgeman pointed out, will overcome vapor lock in hot weather, but it cannot thus be eliminated during spring and fall because a compromise is necessary between gasoline vapor pressure and ease of engine starting. He expressed the belief that vapor lock will be a problem until the fuel feed systems on the majority of motor vehicles on the roads today have been relocated or redesigned.

RAILROAD SAVES $500,000 LAST YEAR FROM USE OF TRUCKS

New Haven, April 16.—Through the use of trucks operated by the New England Transportation Company the New York, New Haven & Hartford Railroad saved approximately $500,000 during 1930 through the non-use of rail equipment, John J. Pelley, president, said here today at the stockholders' meeting. The road's aim in putting on trucks was to eliminate unprofitable trains and speed up service, he said.

For the first quarter the road should earn about 83 cents a common share, compared with earnings of $1.31 a share in the like period a year ago.

AMENDED TRAFFIC BILL PASSES N. J. HOUSE

Trenton, N. J., April 16.—The bill of Senator Reeves of Mercer, changing the present law regulating traffic to conform with conditions arising since the passage of the original traffic act, which was lost in the House last week, was brought up again and passed in an amended form. There was no objection to the bill and it was adopted by a unanimous vote. The previous objection to the bill was the clause which made it mandatory for magistrates sitting on traffic violation cases to give a receipt for the money collected in fines.

DETROIT SEAMLESS STEEL TUBES ELECTS OFFICERS

Detroit, April 16.—The annual meetings of the stockholders and directors of the Detroit Seamless Steel Tubes Company were held on April 14, at which time the retiring directors and officers were re-elected for the coming year. C. H. Hobbs, president and general manager, in his report stated that 1930 had been a profitable year for the company and that so far during 1931 each month had showed an increase over the preceding month and from all indications he believed that business would continue to improve steadily from now on.